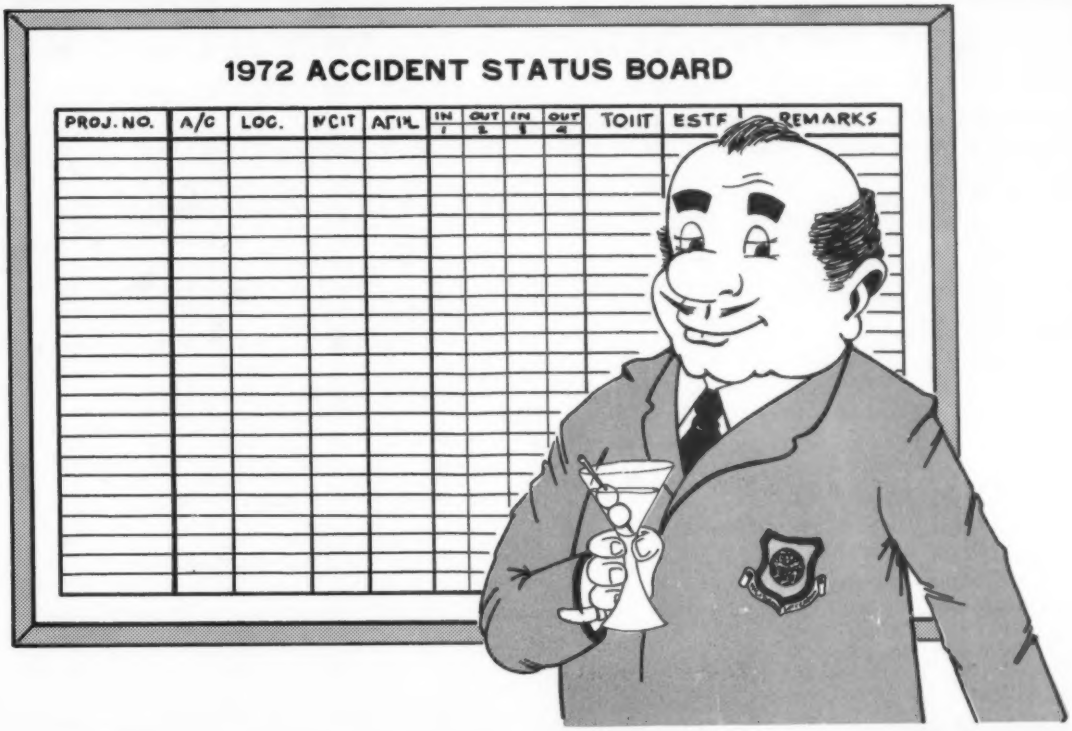
The MAC Flyer

JANUARY 1972



"WILL IT BE YOU IN '72 ?"

MILITARY AIRLIFT COMMAND
GEN JACK J. CATTON Commander
LT GEN JAMES C. SHERRILL Vice Commander
COL HOLLON H. BRIDGES Inspector General
COL N. C. FLYNN Chief, Safety Division

For Greater Efficiency
in MAC Air Operations

The MAC Flyer

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COVER: A clean slate for 1972.
Can we keep it this way?

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Squawk Box

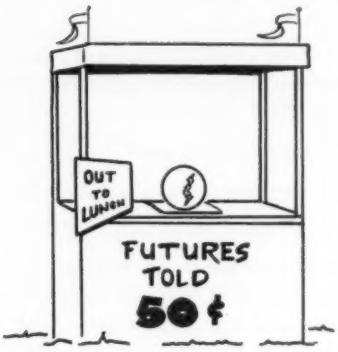
Something new has been added—this column you're reading. It's dedicated to the voice of the little man — your voice and our voice — and will appear in this space every month. It's our own way of opening a communication line upward from the man at the bottom. We'll take the first few, just to get the ball rolling and let the postal service catch up with our magazine lead times. Then you get your chance to sound off. Parts of letters will be used here (with your permission) and all names will be protected (unless you tell us otherwise). Promise.

Incidentally, the talk-back idea is a key point in Grover Tate's tale, "The Confrontation"; the author says something about his message just being between him and the editor. Tain't so, unless *you* want it to be. Your comments or thoughts can remain with the staff, or they can be shared through this column, or they can command a multi-page spread plus artwork. Or they can languish out where you are, if you won't speak up.

Speaking of sounding off, I'll begin. When I was flying the line, I was convinced that people in the head shed were pretty well insulated and didn't care very much about our noisy quarters or marginal flight meals or absurd paperwork or Friday panic missions. Those days are now a few years behind, and my HQ time exceeds my working time. Facts are second hand, and the impression from many folks up here is that all these problems have been laid to rest. Is that so?

Okay, we've opened the door. Remember, this magazine is as much yours as it is ours. Do you have something to speak up about? Just pick a man on our masthead, appoint him your pen pal, and fire away.

A stitch in time will save nine . . .



Crystal Clear Hindsight

by Capt Phil Budd

EVER WANTED TO BE A DECISION MAKER? Well, here's your chance. You've all been in groups where the case study method was used as a learning tool. You took a specific case, followed it step by step to the climax, then made your own decision. Here's an opportunity to try it again. The following incidents are presented as case studies on which you can flex your mental muscles. You be the pilot — you be the supervisor — you be the investigator — you decide just who or what went wrong and what you think the corrective action should be.

Case Number One

A northern based T-39 departed on a normal passenger flight. During takeoff, the cabin overheat caution light came on. The pilots continued the takeoff, retracted the gear, and then moved the cabin temperature selector switch from automatic to manual cold. The overheat condition continued, so they made an intermediate level-off at 9,000 feet and reduced power. The overheat light went out.

The pilots then received clearance to FL 330, and as they advanced power to climb, the overheat light illuminated again. Recalling how the light went out during the previous power reduction, our intrepid mission-oriented support flyers figured the same would be true when they leveled off at altitude. So — they continued their climb. At FL 330 they retarded the throttles, *but the light stayed on*. True to their "press on" philosophy the pilots elected to continue the flight. (The Dash One recommends descending to a lower altitude and selecting "ram" on the cabin air selector. A descent could not be made because of the thunderstorms; "ram" was not selected.)

The pilots and passengers agreed the cabin was hot, but not unbearable. Then, they radioed their supervisor of flying at home base.

You are the supervisor — what will you tell them?

You are the pilot — what will you do?

Case Number Two

For aero club buffs, the following incident should prove interesting. A small single engine aircraft struck a fence while taking off from a sand strip. With a lot of luck, and superior skill and cunning, the pilot kept

the small craft in the air. The pilot checked his passengers and found them visibly shaken. He returned to the small sand strip, landed and deplaned his passengers. The film clip stops here.

You are the pilot — what will you do? *(continued)*

Case Number Three

This incident, which took place off the coast of a southern state, involved a CH-3 on a school support flight. The planned mission included demonstration and practice pararescue jumps and water hoist pickups. All went well during the demonstration, but during the practice pickup operations, a control boat operating in conjunction with the helicopter advised the whirly-winged driver that a panel on his chopper was open, but appeared stable. The pilot flew his craft at minimum safe

airspeed to the nearest landing area; landed; shut down one engine, and deplaned the flight mechanic to investigate. The flight mechanic reported the left engine service platform was open (transmission access and service work platform) and he could not close it.

You are the chopper pilot — what would you do?

Case Number Four

The pilot of a small single-engine aircraft took off on a multi-leg cross country mission. At his final stop prior to returning to home base, the pilot planted the

bird on the runway. As a matter of fact, his rate of descent when he contacted the runway produced what charitably could be termed a hard landing.

You are the pilot — what would you do after engine shut down and prior to the next leg of your cross country?

Case Number Five

And now, to show we haven't forgotten the big boys who fly the heavy transports, a Starlifter case study. The C-141 flew a normal SEA mission without any significant problems until approaching their in-country destination. The crew requested a GCA since the weather was reported as 500 and 1. Due to an extreme wind shear which several previous aircraft had experienced, the GCA controller decided to give the '141 crew a no-gyro approach. He advised the crew that the weather was poor: very heavy rain showers, with turbulence, low ceilings and limited visibility. Throughout the approach the Starlifter was high on glide slope and left of the centerline, and was holding that way when the copilot called 100 above minimums. The copilot then reported the strobes and runway in sight. The pilot went visual and continued the approach. About this same time

the GCA controller instructed them to go around because they were too far left of course for a safe approach. The pilot pulled off power and banked the '141 to line it up with the runway. Heavy rain deluged the windshield and the pilot attempted to level the Starlifter. They were descending rapidly; the copilot yanked back on the yoke — but it was too late. The aircraft struck the ground in a crab about 20 feet short of the overrun and bounced back into the air. The pilot applied full power and started a go-around.

The copilot flew the missed approach as the pilot's ADI failed during the short landing. The crew headed for their alternate, a large secure base with MAC mainte-

nance, where the weather was good. Arriving over their alternate, the crew called ACP who told them the weather at their original destination had improved and they should return for another approach.

You're the pilot — what would you have done?

What Actually Happened?

Okay, you've been through the situations, considered all the factors, and made firm decisions. Now, look at what actually happened.

Case Number One (T-39)

A mutual agreement was reached to abort the mission and land; this, however, was an hour after takeoff. Investigation revealed the hot air mixing valve had stuck in the full hot position, allowing air heated to approximately 350 degrees to enter the cabin, causing considerable damage. The overhead cabin panels and oxygen console were warped and bubbled to the tune of $1,600.

Case Number Two (light airplane on takeoff)

We don't have many details to give you about this incident but we do know that after deplaning his passenger, our "do or die; I can fly," pilot aviated his machine 23 miles to another airport. Once on the ground, he found his craft had suffered numerous broken ribs in wings and tail, plus damage to the wing leading edges, wing spars, and undercarriage. Kind of boggles the mind, doesn't it?

Case Number Three (CH-3)

The pilot decided the work platform, even though open, would remain stable for the short flight back to home base. So he cranked up number one and pressed on. On final approach the crew thought they heard the platform open and close one time, but they landed without incident. After landing, the pilot found the left engine work platform damaged beyond repair with the skin buckled, all the ribs cracked or broken, and the fire detection system damaged. Replacement cost of the door — $1,638.88.

Case Number Four (light airplane hard landing)

Again, we only have brief details of this incident, but we do know enough to send chills up your spine. Following this chap's hard landing, he did not have his machine inspected, but took off and returned 200 miles to home station. After he landed, maintenance personnel found a bent propeller, buckled landing gear, damaged engine bulkhead, and damaged fuselage skin. Is your reaction the same as ours?

Case Number Five (C-141)

The Starlifter pilot agreed with ACP to return to his original destination for another try. He did not advise anyone about his hard landing but he did tell ACP that he had a failed ADI which would restrict him to 300 and 3/4 minimums.

So they returned with the copilot flying a precision approach to approximately 600 feet, where the pilot took over visually and landed. The flight crew noticed considerable damage to the aircraft so the flight examiner engineer wrote up a hard landing in the 781. The ACP controller and maintenance officer told the aircraft commander that the corrective action to clear the write-up would require an extensive inspection, delaying the aircraft for several days. The AC then agreed to erase the discrepancy (a red X item) with the concurrence of the two officers and then press on. The damaged nose gear doors were removed and placed aboard the airplane and a night takeoff (ADI inoperative) made into poor instrument conditions for a one-time flight back to MAC maintenance. Buffeting occurred (apparently due to removal of nose gear doors) above 160 knots and the crew had to fly back at 155 knots and partial flaps. Because of high fuel consumption they diverted to another, closer island base. Post-flight inspection revealed damage to the landing gear and airframe — enough to be classified as a minor accident.

Actions Taken

In the trio of military cases, corrective action was extensive, including pilots being downgraded to unqualified, Dash One changes, special briefings for aircrews, ACP controllers, and maintenance personnel, and strong words from commanders. On the two light airplane incidents we have no information about corrective action.

In all five cases there is one very evident point: taking an airplane or continuing flight in an aircraft with a known discrepancy. In any of the five cases the problems could have developed into a major aircraft accident with loss of life and property. In each case the pilot's actions amounted to senseless risk taking. It's like playing a game of Russian roulette — using a revolver with a single empty chamber.

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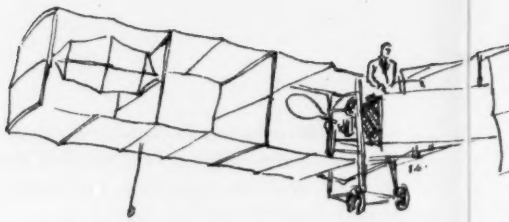
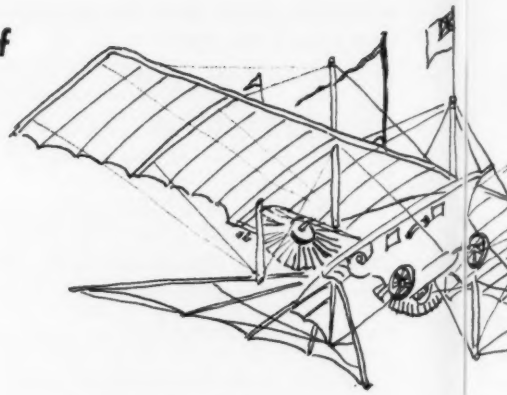


The following essay, written 12 years before the Wright brothers slipped the surly sands of Kitty Hawk, reflects the determination of man in his early attempts to conquer the air. Mr. Nye's satirical observations of the history and probable future of aviation undoubtedly seemed as logical to him as some modern editorials seem to us. Enjoy yourself as . . .

An 1890s essayist reviews the progress of

Flying Machines



by Bill Nye

ALONG AND exhaustive examination of the history of flying machines enables me to give briefly some of the main points of a few, for the benefit of those who may be interested in this science. I give what I do in order to prepare the public to take advantage of the different methods, and be ready at once to fly as soon as the weather gets pleasant.

A Frenchman invented a flying-machine, or dofunny, as we scientists would term it, in 1600 and something, whereby he could sail down from the woodshed and not break his neck. He could not rise from the ground like a lark and trill a few notes as he skimmed through the sky, but he could fall off an ordinary hay stack like a setting hen, with the aid of his wings.

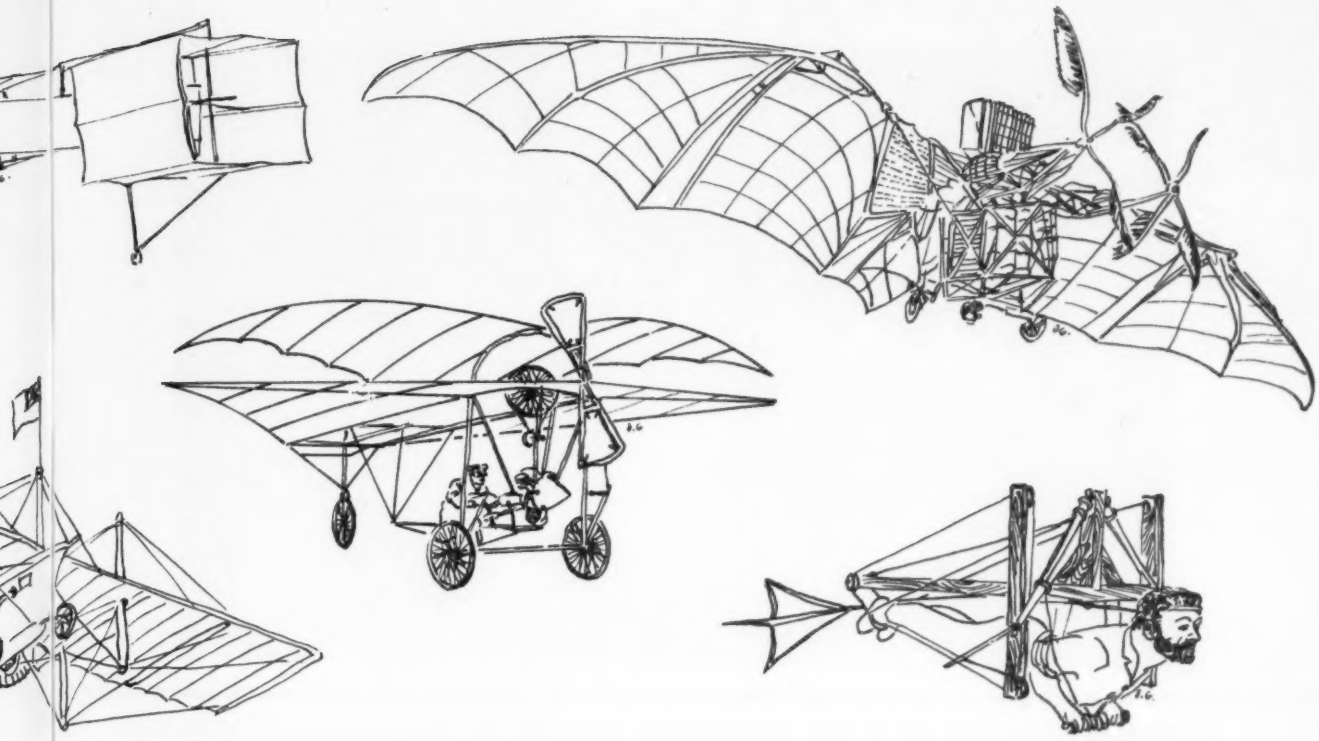
One hundred and twenty-five years after that a prisoner at Vienna, named Jacob Dagen, told the jailer that he could fly. The jailer seemed incredulous, so Jake constructed a pair of double-barrel umbrellas, that worked by hand, and fluttered with his machine into the air 50 feet. He came down in a direct line, and in doing so ran one of the umbrellas through his thorax. I am glad it is not the custom now to wear an umbrella in the thorax.

In England, during the present century, several inventors produced flying machines, but in an evil hour agreed to rise on them themselves, and so they died from their injuries. Some came down on top of the machines, while others preceded their inventions by a few feet, but the result was the same. The invention of flying machines has always been handicapped, as it were, by this fact. Men invent a flying machine and then try to ride it and show it off, and thus they are prevented by death from perfecting their rolling stock and securing their right of way.

In 1842, Mr. William Henderson got out a "two-propeller" machine, and tried to incorporate a company to utilize it for the purpose of carrying letters, running errands, driving home the cows, lighting the Northern Lights, and skimming the cream off the Milky Way, but it didn't seem to compete very successfully with other modes of travel, and so Mr. Henderson wrapped it up in an old tent and put it away in the hay-mow.

In 1853, Mr. J. H. Johnson patented a balloon and parachute dingus which worked on the principle of a duck's foot in the mud. I use scientific terms because I am unable to express myself in the common language of the vulgar herd. This machine had a tail which, under great excitement, it would throw over the dash board as it bounded through the air.

Probably the biggest thing in its



way under this head was the revival of flying under the presidency of the Duke of Argyle, the society being called the Aeronautical Society of Great Britain. This society made some valuable calculations and experiments in the interest of aerostation, adding much to our scientific knowledge and filling London with cripples.

In 1869, Mr. Joseph T. Kaufman invented and turned loose upon the people of Glasgow an infernal machine intended to soar considerably in a quiet kind of way and to be propelled by steam. It looked like the bird known to ornithology as the Flyupithecrick, and had an air brake, patent coupler, buffer and platform. It was intended to hold two men on ice and a rosewood casket with silver handles. It was mounted on wheels, and, as it did not seem to skim through the air very much, the people of Glasgow hitched a clothes line to it and used it for a band wagon.

Rufus Porter invented an aerial dewdad 10 years ago in Connecticut, where so many crimes have been committed since Mark Twain moved there. This was called the "aeraport" and looked like a seed wart floating through space. This engine was worked by springs connected with propellers. A saloon was suspended beneath it, I presume on the principle that when a man is intoxicated he weighs a pound less. This machine flew around the rotunda of the Merchants' Exchange, in New York City, eleven times, like a hen with her head cut off, but has not been on the wing much since then.

Other flying machines have been invented, but the air is not peopled with them as I write. Most of them have folded their pinions and sought the seclusion of a hen-house. It is to be hoped that very soon some such machine will be perfected, whereby a man may flit from the fifth story window of the Grand Pacific Hotel, in Chicago, to Montreal before breakfast, leaving nothing in his room but the furniture and his kind regards.

Such an invention would be hailed with much joy, and the sale would be enormous. Now, however, the matter is still in its infancy. The mechanical birds invented for the purpose of skimming through the ether blue, have not skum. The machines were built with high hopes and a throbbing heart, but the aforesaid ether remains unskum as we go to press. The Milky Way is in the same condition, awaiting the arrival of the fearless skimmer. Will men ever be permitted to pierce the utmost details of the sky and ramble around among the stars with a gum overcoat on? Sometimes I trow he will, and then again I ween not.

The Confrontation

by Maj Grover C. Tate, USAF (Ret)

THE TALL, RANGY KID before me had hair that was too long; his sweatshirt was AWOL from the laundry, and his blue jeans looked like Goodwill rejects. He wasn't exactly the crewcut Air Force Academy type I had planned, but he was the only son I had going for me.

"Why should I volunteer four or five years of my life, or perhaps my life itself, to pursue something that I think is wrong?" he asked. His eyes were clear and honest — but troubled.

"Because," I fired back, "you're a part of this country that is America and you have a responsibility to contribute something to maintain the advantages and the freedoms that you enjoy — because you are a part of it, that's why. I gave a big chunk of my life for it and my old man gave a chunk of his, and *you can too!*" I realized I was yelling at him. I couldn't understand how anyone could fail to be motivated to serve his country, and arguments to the contrary infuriated me.

"If I enjoy those freedoms, why can't I exercise that freedom of choice and stay out of the service?" he asked sincerely. He was being careful not to be flippant for he sensed my belligerence.

"Nothing's free," I replied, trying to remain calm. "You have to earn it, and being in the service is one of the ways you earn that freedom. You don't back out of a responsibility just because you don't agree with it. You don't get out of an obligation by exercising a freedom of choice clause. This country has a job to do and you're a part of this country. You can damn well help to do that job." I felt my reason surrendering to fury.

"But I don't agree with the 'job' that you say we have to do," he countered. "I don't think that we have a responsibility to try and cure the ills of the entire world until we cure our own problems. Just for openers, the way we choose our leaders is archaic, and we're trapped by our own legislative processes rather than being free as you claim. The electoral procedure is all wrong and doesn't really reflect the will of the people. And many

of the other things we do wrong are projected from there. Some clown stamped out by a political cookie cutter can send me to some stinking rice paddy for a couple of years and I don't even have a direct voice in choosing him to represent me. You change those things and you'll get no more arguments from me."

He was being reasonable, I know, but the challenge was too strong. "No, not me, *you* change them," I shot back. "You've got the time and the talent. Just pick out one single thing that you honestly believe is wrong and work on it with all your strength until you change it. And have some of your buddies do the same thing. Together you can bring about the change. I'm talking about working at it, not going around dirty and carrying a psychedelic sign with a worn-out slogan on it. Really working at it. Do your bit in the service, get your degree in law, and start on your crusade. Obey the laws of the land as they are now and if you think they're wrong, then work at changing them," I advised, strongly, but without antagonism.

"Okay, I can accept that advice," he said thoughtfully, then nailed me with a question. "Is that what you've done?" His eyes were bright with victory rather than defeat.

I reached deep into my memory to find an example. To my chagrin, I found only windmills that I'd charged with a vengeance and turned away from before meeting their real challenge.

"What do you mean by that?" I bluffed.

"I mean that you rant and rave about things that you think are wrong, but you don't do anything to change them. For years I have listened to you yell about checkrides and standboards and how they would someday be the death of you. Mom said that you'd volunteer for combat just to get away from a stateside standboard. Why don't you take *that* as a project?" he asked.

He had stopped me cold. I had built a wall and he really backed me up to it. *(continued)*

Photos by Denzel Gaines

The Confrontation

"All right, I'll do that. I'll chase my damned white whale and you chase yours. We'll both do it in good conscience, as gentlemen, and within the bounds of law," I proposed.

"Okay, that sounds reasonable," he answered as he turned to go to his room. "Right now I'm off to the books, but we'll talk some more about it later. Have a nice evening." He was a good winner, but I thought I detected a faint glimmer of smugness in that "have a good evening" bit!

Still irritated over his questions about our nation's integrity and his lack of patriotism, I started to think about the changes I would try to make. Sure it's easy to dream and to promise, but reality is a different cat. It's true — I violenty disagree with the ways of standboards and checkrides, but where do you start to bring about change? If I start sounding off on checkrides, I'll be invited to chat with the IG, get the lowest ER since Benedict Arnold, and wind up as a permanent AO at Thule. How do I get out of this box with my son and with my own conscience? No way except to bite the bullet and get with it. It's easy to make a brave decision for some *future* time, but when that time arrives, the courage to execute that decision is not always there, so the thing to do was to start the battle this very moment — but how?

How about a letter to the editor? Okay, but the editor of what? Flying safety is your argument, so why not start with that?

The following day I dug up a big pad of yellow paper and all the pencils I could find, and a copy of THE MAC FLYER to get the address of the editor. I needed no more; this was the start of my campaign.

* * *

Dear Sir,

I have been in the Air Force for 27 years, flown in many kinds and types of airplanes and grown from a "hubba-hubba" yelling cadet to a grizzled old man. During those years I harbored an ill feeling towards checkrides, which I explained away as a lack of confidence and a dislike for those selected to judge my ability. Some of my most anxious moments in flying have come during checkrides, and I've seen more actual in-flight emergencies triggered by flight examiners than from real world failures. I have no evidence of accidents being caused by flight checks, but I have strong suspicions. Because of not wanting to become involved or to make waves, I kept this aversion locked within me. Now, I must voice my opinion and I have chosen your magazine to bear the brunt of that decision.

As with most complex problems I find it difficult to be constructive. To overcome these obstacles, I shall try to present my philosophy of standboards, checkrides, and flight examiners — rather than critique those with which I am familiar.

My basic premise is that to achieve flight safety we must have safe airplanes and efficient crews. For safe airplanes we follow the required inspections and maintenance procedures. For efficient crews, we need training, practice, and frequent flight evaluations.

Perfection is elusive but must be pursued — particularly when the goal involves saving lives. This pursuit is serious, not a game. The result can be an efficient flight crew with a top-notch airplane, or it can be a smoking hole and charred wreckage. This business of evaluating people for their ability to fly and to cope with emergencies must be built from a base line as serious as the intended goal.

Good, sensible, solid procedures should be evolved from real and honest data. They should be realistic and practical. As an example, refusal speeds should be established using the reactions and capabilities of an average pilot, not the conditioned reflexes of a test crew. All emergency procedures should be tailored to the most marginal crewmember, rather than to the super-talented.

The written examinations should measure a man's knowledge and should be drafted by academically oriented people. These exams, as tests of knowledge, are generally based on information from a written text and need not be written by a crewmember.

The questionnaires regarding the airplane, procedures, emergency procedures, flight rules, weather, survival, and the other appropriate subjects should be made up of pertinent questions. There is no room for sly approaches to the questions, nor for confusing cleverness. The questions should be objective ones with straightforward answers. Basic procedure exams should be closed book and only for those questions requiring chart references should an open book be permitted. My argument here is that we seldom fly through tunnels or under bridges, so it is equally seldom that we need to know the height from the vertical fin to the ground. Never have I changed a landing light in flight, so I don't need to know the type of bulb required. Sounds silly, but I've had to answer sillier things on the proficiency exam.

Instead of being multiple choice, the exams should

require written answers. Too often the questions can be solved with logic and reasonable intelligence rather than knowledge. The exams should be changed often and there should be several versions of each exam with the questions in different sequences. Riding a "pony" is fine for kids, but it has no place when it involves the safety of human life.

The flight checks should be honest evaluations of a crewmember's abi'ity to perform, his knowledge of his job, and his ability to cope with unusual or emergency circumstances. All parties involved in the check should conduct themselves as men and not engage in juvenile games of one-upsmanship and cunning. The evaluation must be professional, free of apprehension, fear, or dread. Unlike on a training flight, where as a man makes mistakes the instructor should show him the correct way — on an evaluation flight the examiner must only observe in an impartial manner.

Emergency procedures demonstration is often a real chamber of horrors. After a furtive, whispered conversation behind him, the crewmember being checked is suddenly confronted with one emergency and then another, compounded by still another. While the flight examiner smiles in unholy glee, the tortured crewman shakes in anguish. But this is *not* what the flight check is all about — if the FE likes that sort of thing, the local amateur playhouse is a better place for him. Fuses and circuit breakers are for a very definite purpose, and that purpose is not as a toy for FEs to pull as whimsy suggests.

With horror, I can recall a C-124 valiantly hanging on its props fighting off a stall, while the FE chattered on about how to recognize landing configuration stalls, recovery from stalls, and the unpleasant results of non-recovery. Busy with words, he failed to notice the flaps were still up.

Other recollections are:

"Is this a real fire or is it simulated?"

"Negative, but don't shut down number two. Number four's already down for real."

"It's a damn *realistic* simulation, 'cause there's hydraulic fluid all over the place."

"Negative, I didn't pull the fuse on the attitude indicator."

Etc. . . .

Following the evaluation, the critique should help all concerned and should show the crewmember as proficient; as proficient but needing improvement in certain identified areas; or as not proficient. The guy found needing improvement should not be checked out until he demonstrates that improvement, and the non-proficient troop should be sent through a complete requalification course before being rechecked.

Good evaluating means take the buddy aspect out of the system completely. Just because a crewmember is a friend is no reason to judge his performance differently than that of a complete stranger. Rank should not be a consideration, for I've never seen a chicken on a pilot's shoulder help him fly any better.

"No-notice checks" are great, as long as they're not done with the "gotcha" attitude. The check is supposed to be an evaluation of a man's day-to-day routine capabilities, and not of his ability to operate in an extremely hostile environment.

The people selected to establish, administer, and supervise evaluation programs should be the very best that can be found, and not just those that are available, or those with the most flying time.

In summary, if I were responsible for the total flight evaluation program, these are the goals I would set:

Evaluate the present frequency required for flight checks to determine if that period is realistic.

Have written exams prepared by experts in the field of knowledge measurement.

Administer both the written exam and flight check by competent, objective, well qualified flight examiners.

Establish a philosophy for the post exam critique that will truly be beneficial.

Create an attitude regarding flight checks that would result in a crewmember being proud to have made a good showing, rather than one who is satisfied that he outwitted the system.

This, sir, is the sum of my opinions and philosophies regarding flight checks. We need a change.

* * *

I signed it, packaged the whole thing together hurriedly, and mailed it before I lost my courage. That night when I returned home, the light was spilling from beneath the door of my son's room, so I stuck my head in. Rather smugly, I told him what I had done, bid him good night, and retreated to the darkened hallway.

The smugness left and a feeling of guilt sneaked into its place. I knew my discussion would only be between the editor and me. But I did try, and that had *some* value. Especially to me.

Maybe I'll make thirty after all and maybe he'll really do something that will make the world a better place.

Remember that high school English teacher who said you couldn't write? Here's your chance to prove she was wrong and also see . . .

Your Byline in . . .

The MAC Flyer

OUR ANNUAL Flying Safety Writing Contest is underway! If you haven't started molding your thoughts and roughing a draft, don't despair — it's not too late yet. But time's awastin' — we need your ideas!

This is your chance to tell it like it is and have the chiefs listen. Your entry has a chance to win an award and be published in THE MAC FLYER, under your byline. The contest started on the first of January and will end 31 March 1972.

The first three place winners will receive an engraved walnut desk set, presented by the Chief of Staff of the Military Airlift Command. Honorable Mention winners will receive a handsome pen and pencil set.

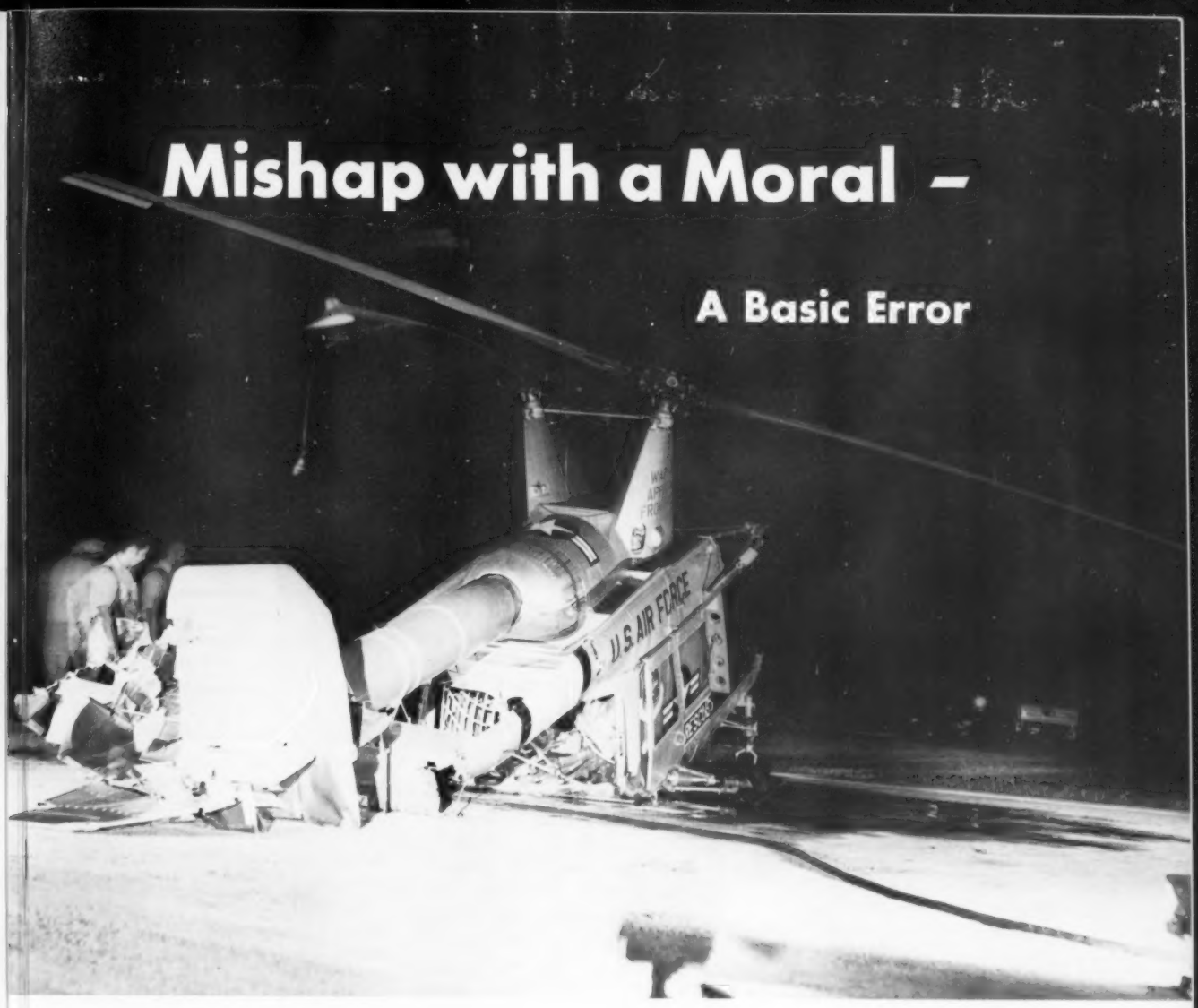
Who can enter? *You* can. All aircrew members, maintenance and support people are vital to flying safety and are urged to enter. While only military personnel and DAF civilians assigned to MAC or MAC reserve forces are eligible for awards, anyone can submit an entry. All "non-award eligibles" will receive appropriate special recognition. No more than three entries per individual — please!

Your entry must be original, unpublished, and have a valid flying safety message for MAC. Other than that, your options are endless: fiction, non-fiction, technical articles, poetry, editorials — whatever turns you on. Please keep each entry between 1,000 and 3,000 words. That's about 6-14 pages, double spaced.

Your entry should be typed in two copies, double spaced, with no identification except the title. Then attach a cover sheet with the story title, your name, address (military address if you have one) and a brief biographical sketch. Mail your entry to: The MAC Flying Safety Writing Contest, MAC/IGYE, Scott AFB, Illinois, 62225. Entries must be postmarked no later than 31 March 1972, and must be received at MAC/IGYE on or before 7 April 1972.

Mishap with a Moral –

A Basic Error



IT WAS AN EVENING in early spring — 1930 local time — when an HH-43 crew assembled in their detachment alert room to brief for a night local training mission. There were to be five people aboard the aircraft — an instructor pilot, a fully-qualified first pilot, a medical technician, a pararescue man, and another man who was transferring into the detachment. Because he was still unqualified, this last man would be a passenger.

Using the unit's briefing checklist, the first pilot briefed on the planned 1.5-hour mission. The flight was to be a night local training mission and would include practice night hoist pickups and local area familiarization. The first pilot discussed the route of flight, procedures to be used during the hoist pickups, and the TOLD card. The instructor pilot then added that, since one of the men aboard technically would be a passenger, there would be no emergency procedures training. After this comprehensive and professional preparation, the crew proceeded to the aircraft.

All checklists were accomplished and, at 2014, the Huskie lifted off the pad. The first pilot was flying the aircraft from the right seat with the instructor pilot observing from the left.

A slight problem became apparent during the first few minutes of flight. The first pilot's interphone began cutting out and soon he could only receive transmissions made using the interphone call position. The instructor pilot commented that he had to reach over to the interphone control panel with his right hand every time

he wanted to say anything to the pilot. The first pilot agreed that it was awkward but both pilots felt it was merely inconvenient and not a hazard to flight. They continued the mission.

After approximately 20 minutes of flying time, the instructor pilot in the left seat assumed control of the aircraft and obtained clearance to proceed to the helicopter pad. At the pad, he and the medical technician made a night practice hoist pickup. The instructor pilot then landed the aircraft, and the medical technician secured the hoist equipment. After the med tech was back aboard and strapped in, the pilots accomplished the before takeoff checklist and the instructor pilot lifted the helicopter to a ten-foot hover.

After establishing the hover, he made a 360 degree turn. While in the turn, the instructor pilot felt that the collective friction was too tight. The only adjustment knob was on the first pilot's collective stick, but because of the interphone problem the instructor pilot was unable to ask him to loosen the friction. So the instructor pilot decided to do it himself. Still in the ten-foot hover, he released the collective and put his left hand on the cyclic stick. To steady his arm, he rested it against his leg. Then he took his right hand off the cyclic stick and reached down and to the right toward the collective friction adjustment on the first pilot's collective stick. Unsure of reaching the adjustment by feel alone, the instructor pilot also turned his head and looked toward the stick. At this moment, while the instructor pilot's head was inside the cockpit, the first pilot turned his head and looked to the right to clear the area, anticipating an immediate takeoff.

Suddenly, while the instructor was looking for the collective friction adjustment and the other pilot was looking to the right, they both realized that the helicopter had entered an extremely nose high attitude and was moving to the rear and down. Both pilots tried to regain control but the helicopter hit the ground — tail first — before they could stop it.

The crewmembers and the passenger suffered only minor injuries and did not require hospitalization, but the helicopter received enough damage to put the mishap in the major accident category.

Investigation

A careful analysis of the facts and circumstances surrounding this accident produced few surprises. The board was unable to uncover any evidence of serious mechanical problems with the helicopter. They did determine that the crew involved was qualified and adequately prepared for the mission. Eventually, they were forced to conclude that the accident — like so many others — was the result of several unusual conditions. None of these factors posed any particular problem individually, but they combined in such a way that the accident became inevitable.

An inoperative interphone in the right seat of the helicopter was the first link in the chain. It seemed to be no real problem — just a nuisance; neither pilot considered aborting the mission for it. But because of it, the instructor pilot had to take his right hand off the controls to talk to the first pilot. This influenced his actions at a critical moment.

The excess collective friction and the fact that the only adjustment was on the first pilot's control, also helped set up the accident. These factors, by themselves, were not serious, but the fact that they existed contributed to the final result.

The helicopter was in a ten-foot hover at night. This is not an unusual situation — most helicopter pilots would consider it a routine flight condition. However, the HH-43, like most helicopters, is not particularly stable in a hover. It requires constant pilot control inputs to remain steady. Also, at an altitude of ten feet, the ground is awfully close to the tender airframe. So, although a ten-foot hover at night is not an unusual flight condition, it is a critical one — perhaps more critical than most helicopter pilots think it is.

Let's put these conditions together and see how they produced two other unusual circumstances which finally broke the airplane.

After the hovering 360-degree turn, the instructor pilot wanted the collective friction reduced. The only adjustment for it was on the first pilot's collective stick, so the instructor pilot would normally have asked the first pilot to reduce it. But the interphone wasn't working properly — so he couldn't do that. He could switch hands on the controls, and with his right hand free, use the call position of the interphone to talk to the first pilot or attempt to adjust the friction himself.

Most helicopter pilots have flown "cross-handed" with their left hand on the cyclic stick at some time. It's not unusual during long missions, for example, or while operating radios or other equipment in some helicopters. In this case the instructor pilot decided to switch hands during what he considered was a normal flight condition—a ten-foot hover at night.

A normal condition perhaps, but a critical one. He changed hands; this was the next to the last unusual circumstance.

With his left hand on the cyclic stick maintaining the ten-foot hover, the instructor pilot reached *and looked,* down and to the right, toward the collective friction adjustment. This was the last unusual circumstance, and the one that finally completed the chain of events and broke the airplane. By looking down into the cockpit the instructor pilot had lost his outside visual references as surely as if he had encountered blowing dust or snow! At this point only the first pilot could have prevented the accident. Unfortunately, he was looking off to the right and didn't monitor the aircraft's position closely enough. By the time he was aware they were in trouble, it was too late.

Conclusions

The primary cause of this accident — that thing which made the accident inevitable — was a simple, basic error: the pilot in command did not maintain adequate visual references while hovering. Consequently, he lost control and crashed.

There were a number of options open at the moment the instructor pilot decided to adjust the collective friction. He could have landed the helicopter and adjusted it on the ground. He could have postponed resolving the problem until after he had climbed to a safe altitude. Or he could have just ignored the problem entirely and flown with the friction a little tighter than he liked. Any of these courses of action would have eliminated the accident.

A well qualified, highly experienced helicopter pilot made a basic error in judgment. Faced with several insignificant problems, he didn't see the significance of their total effect. He treated them casually, when in fact the situation was becoming critical.

After the fact — with the circumstances and results made plain — it's easy to judge. We rationalize and explain to ourselves that someone else might make a mistake like that, but we would never do so. To those who hold this attitude, THE MAC FLYER has only one question: Are you sure?

Aesop for Aviators

Once in the era long before the Greddle Squeeze an unmentionable aircraftly was flying from Luddle Heaprow to a Foreign Land. The crew were all from the Country Clump — a body vastly experienced in VIP Frights.

As they neared the moment when they were to reunite the Dundollop roundy-wheels with The Good Old Mother Earth, they entered a Lotty mount of strato claggimus. This necessitated an instrumental-electro-magical letting down.

"Hello Good Old Mother Earth down there," said the Communicator, "how is your meaty-roger-tickle Roger Over?"

"Allo Roger Over," spoke up the bold Air Traffic Confuser from the Good Old Mother Earth. "Ve iss havink ze vind up ze vest, ze driddle am driddling und zer bermetricks of Doo-Niner-Doo-Tree."

"Ha-har!" shouted the Squabling Leader Capital. "Why do not these garlic-eating . . . speak in milliminibars instead of hinges of mercy?"

"Clapting I have converted it to 986.5 miniwhatnots" said the Communicator.

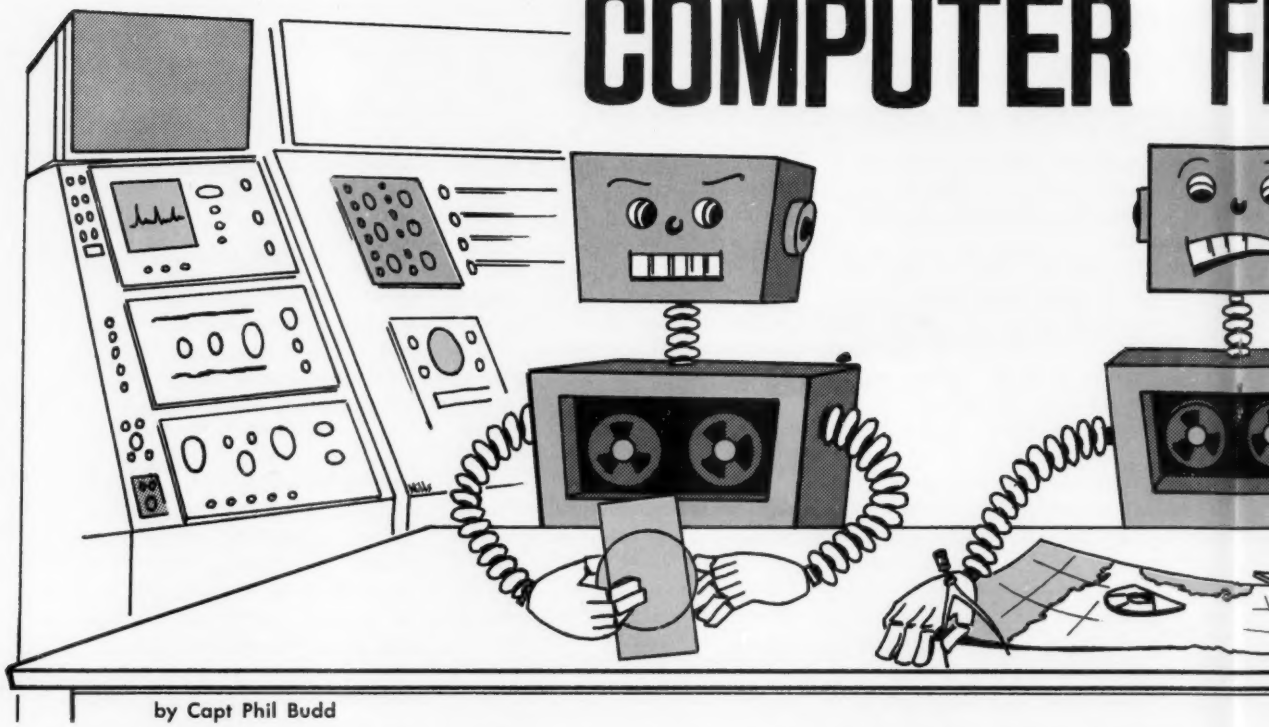
"It is set upon the snail of my heightimeter" answered the Clapting.

Said the Navvigman "You are over the bacon now, turn onto two two two degrades." And so they settled onto the Slide path. "Mine breaking height is 250 feet above the Good O'd Mother Earth" quoth the Capstan. At 250 feet on his heightimeter they broke through the cloud and there was a tall conifurry tree up to 150 feet above the roots and they missed it by ten foots. And all their hair turned white.

Moral: Hinges of mercy and millibuses mixed in the wrong way can cause many a hair to turn grey.

(With acknowledgements to the R.A.F.'s Air Support Command Flight Safety Review and Digest)

COMPUTER FL



by Capt Phil Budd

EUCLID, HOME FROM A HARD DAY at the chariot races, sat gazing into the distance. He tugged pensively at his beard, took a long pull from his goblet, and profoundly stated: "A straight line is the shortest distance between two points."

No one questioned Euclid, and for the next two thousand years we went on believing that if you traveled in a straight line you would reach your destination in the shortest distance and hence the shortest possible time. This worked fine until Orville and Wilbur invented the airmachine. Then someone asked, "How do you fly from point A to point B in the least amount of time and use the least amount of gas?"

Answers ranged from "fly a straight line," to "fly higher," to "fly downhill all the way." Being the ingenious species we are, someone came up with a technique called flight planning. We all have been exposed to flight planning during our flying careers, but some of us have not had the opportunity to spin a flight plan manually since we left pilot or navigator training. Why? Because the computer has been doing it for us. What we would like to do in this discourse is share a short history of computer flight plans (CFPs), discuss their present state, and explain how you get your personal copy.

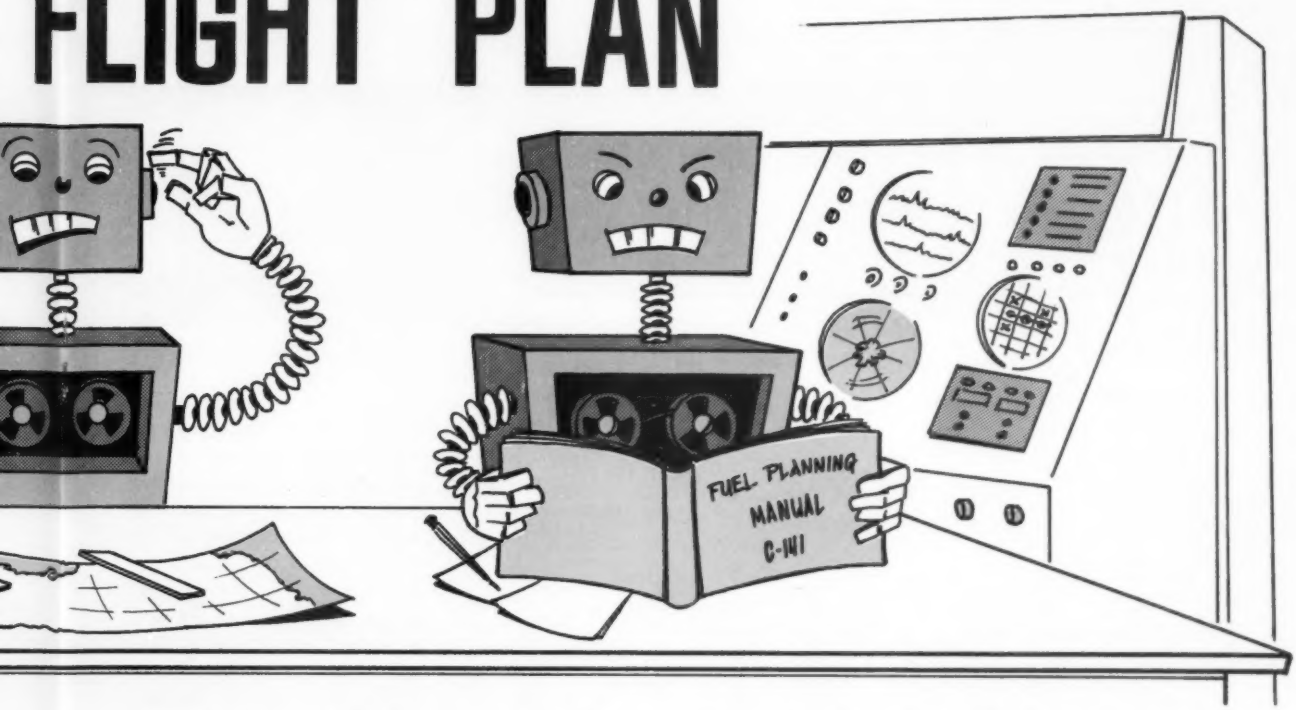
Early Ideas

The idea of a CFP originated in the mid 1950s and can be traced to Dr. Robert D. Fletcher, presently chief scientist for Air Weather Service. He saw a need for computers in weather forecasting and in its application to flight planning. Dr. Fletcher's idea was to combine the meteorological and navigational problems of minimum-time flight planning into a computer operation. The objectives were: 1. rapid flight planning, 2. improved weather support, 3. manpower savings, 4. increase in major command control, and 5. greater flexibility by centralization of flight planning activities.

The system which was developed was a computerization of earlier graphical, manual methods. It was called minimal flight planning (MFP), since it showed the pilot how to reach his destination in minimum time. It worked, but it presented problems in that it paid no attention to other trans-oceanic traffic, which was increasing rapidly.

MFP proved to be unacceptable to ATC and ICAO since the tracks would wind like spaghetti across the ocean. So fixed route structures were set up by these authorities. Air Weather Service's Majors Forrest Miller and Graham St. John were quick to step into the picture and solve the new problem. The revised system computed flight plans for *all* trans-oceanic routes and picked out the fastest one. Today's CFPs are

FLIGHT PLAN



prepared in a very similar manner, but the time factor has been reduced considerably, and better computers and computer programs have given us a more usable flight plan. Also, timeliness of delivery, the quality of the meterological input through AIREPs and the communications networks have been greatly improved.

The ultimate goal of the CFP is to achieve a fully automated, real time demand system, capable of processing and transmitting back to the requester and user a complete flight plan. Eventually, the system will have the capability of providing optimum route/profile selection, flight level and leg temperature plus terminal and alternate weather.

Testing

Paper tests of the numerical flight plans began in February 1959, and operational testing began in May 1959 over six routes in the Atlantic. Flight plan altitude in the first phase of testing was 18,000 feet, the primary altitude of our C-118s. Test routes were: Harmon to Prestwick, Harmon to Ploneis, Harmon to Lajes, Nantucket to Lajes, Lajes to Ploneis, and McGuire to Harmon. The numercial flight plans were produced twice daily at Suitland, Maryland, by the Joint Numerical Weather Prediction unit (a combined effort of the Air Force, Navy, and U.S. Weather Bureau) and then they were forwarded to McGuire AFB's Transport Control Center (now called ACP). The results were very encouraging and phase two began in July 1959. This time, flight plans for 19 more routes at an altitude of 10,000 feet were computed. This opened the CFP to the C-124s.

Moving

In August 1970 MAC's computer flight planning center moved from Suitland to Air Force Global Weather Central (AFGWC), Offutt AFB, where AWS has its large computer complex. This relocation was made due to limited amount of computer time allotted each hour for production of flight plans. This move provided MAC with access to computers in a military oriented complex and saved MAC approximately $150,000 annually in leased computer time. This relocation also moved AWS a step closer to centralized weather forecasting and allowed better meteorological inputs to the CFP. In a little over a decade, we moved from a computer system which took 15 seconds to produce a flight plan and a communication network that sometimes took a day to deliver it, to a system that produces a CFP in five seconds and has it to the user in an hour. And this time will be shortened when the AUTODIN system is tied directly to the computer.

Today's CFP

That's the history. Now let's look

CFP

```
UNCLAS AFGWC
MAC COMPUTER FLIGHT PLAN          584K1RWY0020                    CFP1-3010649.6
584K RWY KBLV KWRI                          H L/O 11          C-141A 28/17Z-237
SCOTT          ALT   WIND       TAS  GS  ZD  ZT   TT        TDR  TC  MC  MH CAL
  3833N  8951W                                               744
BIBLE GROVE    250 236/ 29       347 375  68  10   10        676 071 068 069
  3855N  8829W
INDIANAPOLIS   270 238/ 50       440 490 112  14   24        564 061 060 060
  3949N  8622W
BELLAIRE       270 242/ 41       447 484 256  32   56        308 087 089 091
  4000N  8049W
COYLE          270 250/ 24       447 469 294  38  134         14 092 100 101
  3949N  7426W
MCGUIRE        270 254/ 14       447 443  14  02  136          0 327 338 336
  4000N  7436W
   FWF  +32  WF1  +41  WF2        +22  ETP   43   PG 065      TOGW 260  STD
A1 DOVER            257/ 12      447 438  84  12  KDOV
  1-0136 026060  2-0000 000000        3-0136 026060  4-0012       000856
  5-0045 007560  6-0015 002500        8-0248 039976  9-0019000
  10-041876  13-013916  B/O-028560
A2 ANDREWS          255/ 14 447 434       148  21  KADW
  1-0136 026060  2-0000 000000  3-0136       026060  4-0021       000625
  5-0045 007560  6-0015 002500  8-0257       042145  9-0019000
  10-044045  13-016085  B/O-028560
```

Figure 1

at a computer flight plan we use today. Figure 1 is a CFP as it comes out of AFGWC's Univac 1108 computer. Figure 2 is a similar flight plan attached to the navigator's MAC Form 25. This form and flight plan probably seem familiar to many of you out on the line, but some of the numbers need closer examination.

CFP schooling for crewmen is pretty casual. At present, the only training a nav gets in deciphering or using a computer flight plan is what he receives during his initial upgrading. This will soon change as CFP instruction is introduced into undergraduate navigator training. A pilot is exposed to CFPs more or less on an OJT basis — he watches the nav and the AC as they flight plan, and if he's lucky the AC will explain what they are doing. However, he learns, and by the time the new troop is ready to upgrade to AC he knows enough about CFPs to razzle dazzle the examiners.

To fill the knowledge gap of those still a trifle in the dark, we'll take a short tour through a CFP. Here is a chance to get a little inside info that may make your future trips run smoother.

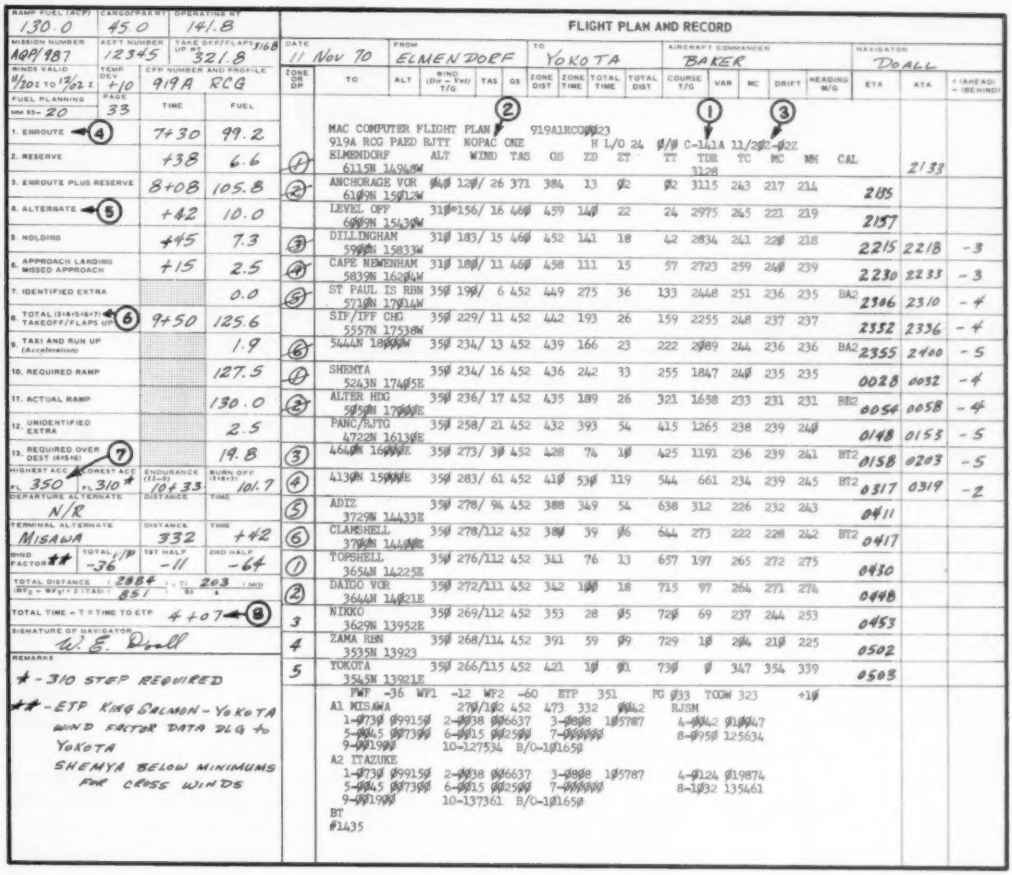
Let's look at figure 2 again. There are several items to check, starting with item 1: Is the flight plan for your type aircraft? Item 2: See if the flight plan matches the route you intend to fly. Then make sure the valid time (3) of the flight plan covers your takeoff time. If all these check out, press on with your flight planning.

The entries on the left side of the Form 25 are also of interest. If you will refer to figure 2 again you'll see 13 numbered blocks plus some other squares, offering figures you, as a flight planner, should be aware of. As you are filling out the 175 or ICAO form some of these numbers will be used. For example, you will need the en route time (4). And depending on what type of flight plan you are filing, you may need to know the time to alternate (5). Total fuel required at takeoff is important, especially if fuel will be critical (6). And down a little farther in this same column are the highest and lowest altitudes you can accept for your mission (7), important facts to know prior to receiving your clearance. You can also lift the equal time point out of this column (8).

Now if you will move your eyeballs to the very bottom of the computer printout, you will see "A1 MISAWA, A2 ITAZUKE." These are the recommended alternates. The numbers that follow these alternates correspond to the figures in the column on the Form 25. These figures can be used as a handy check against the computations from the fuel manual. The last figure, preceded by "B/O," is the burn off fuel. Your loadmaster will use this figure in preparing his Form F.

Problems

With the advent of the CFP several problems have reared their ugly heads and should be mentioned. We have lost aircraft because people have not paid enough attention to the items we have just mentioned. For example, a transport was lost recently because the crew was using



RAMP FUEL (ALP) 130.0 | CARGO/PAX WT 45.0 | OPERATING WT 141.8
MISSION NUMBER AQA/987 | ACFT NUMBER 12345 | TAKE OFF/FLAPS UP WT 321.8 T/68
WINDS VALID 11/20Z TO 13/02Z | TEMP DEV +10 | CFP NUMBER AND PROFILE 919A RCG
FUEL PLANNING MM 65- 20 | PAGE 33

	TIME	FUEL
1. ENROUTE (4)	7+30	99.2
2. RESERVE	+38	6.6
3. ENROUTE PLUS RESERVE	8+08	105.8
4. ALTERNATE (5)	+42	10.0
5. HOLDING	+45	7.3
6. APPROACH LANDING MISSED APPROACH	+15	2.5
7. IDENTIFIED EXTRA		0.0
8. TOTAL (3+4+5+6+7) TAKEOFF/FLAPS UP (6)	9+50	125.6
9. TAXI AND RUN UP (Acceleration)		1.9
10. REQUIRED RAMP		127.5
11. ACTUAL RAMP		130.0
12. UNIDENTIFIED EXTRA		2.5
13. REQUIRED OVER DEST (4+5+6) (7)		19.8

HIGHEST ACC ALT FL 350 | LOWEST ACC ALT FL 310 * | ENDURANCE (11-8) 10+33 | BURN OFF (11-9) 101.7
DEPARTURE ALTERNATE N/R | DISTANCE | TIME
TERMINAL ALTERNATE MISAWA | DISTANCE 332 | TIME +42
WIND FACTOR ** | TOTAL +/- -36 | 1ST HALF -11 | 2ND HALF -64
TOTAL DISTANCE (WT2 - WF1 ÷ T ETA/AT) 2884 / 851 | +TL 203 | SHD
TOTAL TIME - T ETP TO ETP 4+07 (8)
SIGNATURE OF NAVIGATOR W. E. Duall

REMARKS
* - 310 STEP REQUIRED
** - ETP KING SALMON - YOKOTA WIND FACTOR DATA DLG to YOKOTA
SHEMYA BELOW MINIMUMS FOR CROSS WINDS

FLIGHT PLAN AND RECORD

DATE 11 Nov 70 | FROM ELMENDORF | TO YOKOTA | AIRCRAFT COMMANDER BAKER | NAVIGATOR DoALL

ZONE OR DP	TO	ALT	WIND (Dir – Vel) T/O	TAS	GS	ZONE DIST	ZONE TIME	TOTAL TIME	TOTAL DIST	COURSE T/O	VAR	DRIFT	HEADING M/O	ETA	ATA	+ (AHEAD) – (BEHIND)
	MAC COMPUTER FLIGHT PLAN (2) 919A RCG PAED RJTT NOPAC ONE 919AIRCØØ23 N L/O 24									ØØØ C-141A 11/2ØZ-ØØZ (1) (3)						
(1)	ELMENDORF 6115N 14948W	ALT	WIND	TAS	GS	ZD	ZT			TT 3128	TDR	TC	MC	MH	CAL	
(2)	ANCHORAGE VOR 6100N 15012W	ØØØ	120/ 26	371	384	13	Ø2			Ø2	3115	243	217	214		2135
	LEVEL OFF 6000N 15430W	310	156/ 16	460	459	14Ø	22			24	2975	245	221	219		2157
(3)	DILLINGHAM 5900N 15833W	310	183/ 15	460	452	141	18			42	2834	241	220	218		2215 2218 -3
(4)	CAPE NEWENHAM 5839N 16200W	310	180/ 11	460	458	111	15			57	2723	259	240	239		2230 2233 -3
(5)	ST PAUL IS RBN 5710N 17014W	350	190/ 6	452	449	275	36			133	2448	251	236	235	BA2	2306 2310 -4
	SIF/IFF CHG 5557N 17538W	350	229/ 11	452	442	193	26			159	2255	248	237	237		2332 2336 -4
(6)	5444N 18000W	350	234/ 13	452	439	166	23			222	2089	244	236	236	BA2	2355 2400 -5
(1)	SHEMYA 5243N 17600	350	234/ 16	452	436	242	33			255	1847	240	235	235		0028 0032 -4
(2)	ALTEN HDG 5050N 17600E	350	236/ 17	452	435	189	26			321	1658	233	231	231	BB2	0054 0058 -4
	PANC/RJTG 4722N 16130E	350	258/ 21	452	432	393	54			415	1265	238	239	240		0148 0153 -5
(3)	4640N 16000E	350	273/ 30	452	428	74	10			425	1191	236	239	241	BT2	0158 0203 -5
(4)	4130N 15000E	350	283/ 61	452	410	530	119			544	661	234	239	245	BT2	0317 0319 -2
(5)	ADIZ 3729N 14433E	350	278/ 94	452	388	349	54			638	312	226	232	243		0411
(6)	CLAMSHELL 3700N 14400E	350	278/112	452	389	39	Ø6			644	273	222	228	242	BT2	0417
(1)	TOPSHELL 3654N 14225E	350	276/112	452	341	76	13			657	197	265	272	275		0430
(2)	DAIGO VOR 3644N 14021E	350	272/111	452	342	180	18			715	97	264	271	276		0448
3	NIKKO 3629N 13952E	350	269/112	452	353	28	Ø5			720	69	237	244	253		0453
4	ZAMA RBN 3535N 13923	350	268/114	452	391	59	Ø9			729	10	204	210	225		0502
5	YOKOTA 3545N 13921E	350	266/115	452	421	10	Ø1			730	Ø	347	354	339		0508

FWF -36 WF1 -12 WF2 -60 ETP 351 FG Ø33 TOGW 323 +1Ø
A1 MISAWA 270/102 452 473 332 ØØ42 RJSM
1-Ø730 Ø99159 2-ØØ38 ØØ6637 3-ØØØ8 105787 4-ØØ42 Ø19847
5-ØØ45 Ø07309 6-ØØ15 ØØ2599 7-ØØØØØØ 8-Ø959 125634
9-ØØ1999 10-127534 B/O-1Ø1659
A2 ITAZUKE
1-Ø730 Ø99159 2-ØØ38 ØØ6637 3-ØØØ8 105787 4-Ø124 Ø19874
5-ØØ45 Ø07309 6-ØØ15 ØØ2599 7-ØØØØØØ 8-1Ø32 135461
9-ØØ1999 10-137361 B/O-1Ø1659
BT
#1435

Figure 2

a high altitude flight plan while flying in the low altitude structure. Their eight-thousand foot flight path ended at an 8,200-foot mountain.

Another problem could arise if flight plans are used after they expire. If your takeoff time does not fall within the valid time of the flight plan, the winds and weather are not valid. This is something you need to think about if you have to pound the ramp for any length of time. Your flight plan can be out of date by the time you get ready for takeoff. If this happens, give Metro a call on the radio and get the CFP winds and your weather updated.

Distribution Mechanics

We've been talking about how much time CFPs save, how they enhance safe operations, etc., but how do *you* get yours? In our vast and efficient command and control system, it's easy. By the time you are alerted for a scheduled MAC mission, the area ACP has already ordered a CFP for you.

Let's use an example to see how it works. Say your mission originates at McChord and is scheduled for a typical MAC route: to Elmendorf and then to Yokota. About three hours before you are alerted the flight planner at the 22 AF command post at Travis orders a flight plan from AFGWC for your flight to Elmendorf. Then about the time you are alerted, your CFP arrives at McChord ACP. By ordering the CFP six hours prior to takeoff, the flight planner assures it will be in your crew folder three hours prior to takeoff. This allows ACP to plan your fuel load and ACL.

The same thing again takes place for the flight plan you will receive on your quick stop at Elmendorf. The flight planner at Travis orders your second leg flight plan so that it will be at Elmendorf three hours

CFP

Ed Note: Our thanks to Lt Col Harold O. Morrisson, MAC/DO, and Lt Col William H. Quelch, Jr, AWS/IO, for their contributions to this article.

prior to your scheduled departure. The base ACPs should not even get into the act; the area flight planners monitor all scheduled MAC missions and it is their job to make sure you have a CFP.

Now, what happens when you transit a base that does not have a MAC ACP? The area flight planner orders your flight plan as usual, but he has it sent to the en route base comm center with instructions for them to call base ops, the ALCE, or your contact, who should pick up the flight plan for you. Sometimes the program falls apart at this point, and you never receive a flight plan, so the area flight planner also orders another CFP for your second leg and gives it to you when you depart on your first leg. For example, you are flying from Travis to Scott to McGuire. At Travis you will receive a CFP for your route from Travis to Scott plus one from Scott to McGuire. When you arrive at Scott (which has no ACP) a more current CFP (Scott to McGuire) will be waiting for you at base ops. If for some reason Murphy got into the act, you still have the flight plan you received at Travis, and all you need to do is update the winds and weather.

Even when you are on several legs off the beaten track — such as down through South America or Africa or the Mid-East — your flight plan should be waiting for you. The area flight planner still monitors your mission and sends the CFP to the American Embassy or MAAG with instructions to deliver it to you. Or in those cases where we have a support contract with a civil airline, the CFP will be sent to their local operations office. You will be briefed before you depart for these stations on who you should contact when you arrive. Finally, prior to leaving on a trip to the boonies you will receive a packet of no-wind flight plans covering all your legs. These are regular CFPs (figure 3) but you have to fill in the blanks; i.e., winds, altitudes, times.

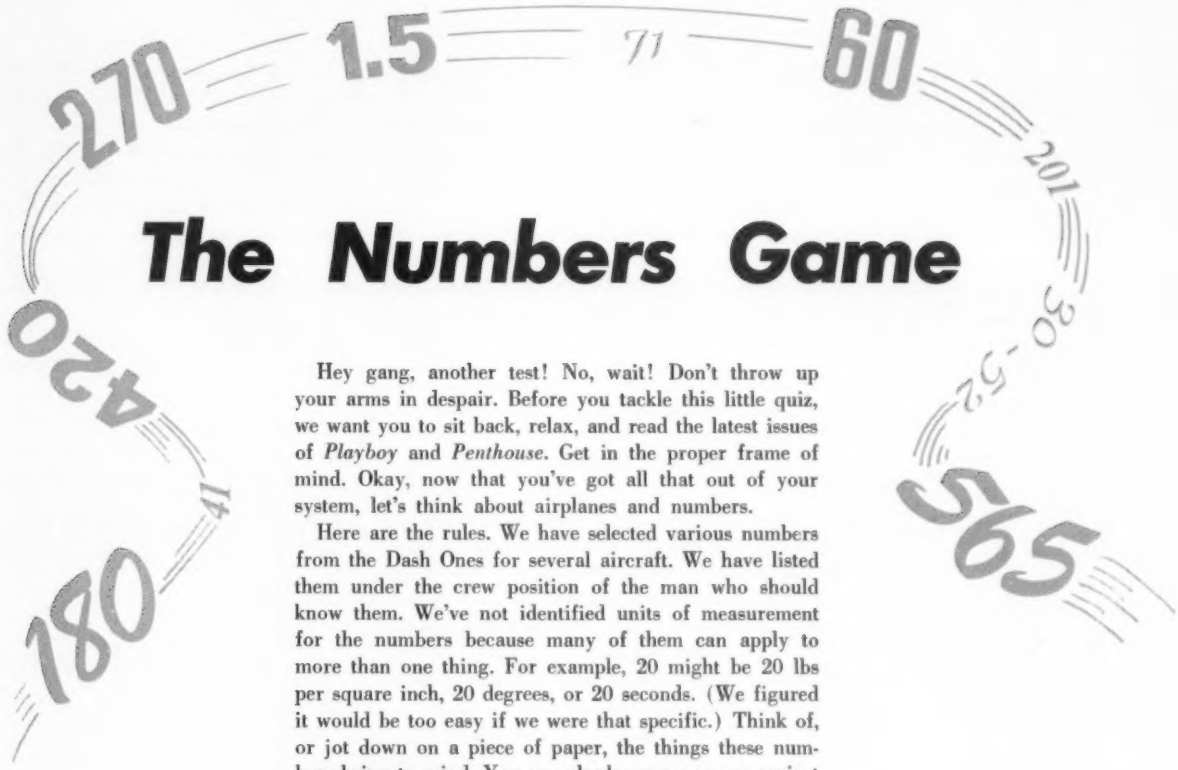
```
UNCLAS AFGWC
MAC COMPUTER FLIGHT PLAN          584K1SSSØØ2Ø                    CFP1-3Ø1Ø65Ø.Ø
584K SSS KBLV KWRT                      H
SCOTT            ALT   WIND       TAS  GS  ZD  ZT    TT    TD    TC  MC  MH CAL
  3833N  8951W
BIBLE GROVE      --- ---/---      --- ---  68 ---  ----    68   Ø71 Ø68 ---
  3855N  8829W
INDIANAPOLIS     --- ---/---      --- --- 112 ---  ----   18Ø   Ø61 Ø6Ø ---
  3949N  8622W
BELLAIRE         --- ---/---      --- --- 256 ---  ----   436   Ø87 Ø89 ---
  4ØØ1N  8Ø49W
COYLE            --- ---/---      --- --- 294 ---  ----   73Ø   Ø92 1ØØ ---
  3949N  7426W
MCGUIRE          --- ---/---      --- ---  14 ---  ----   744   327 338 ---
  4ØØ1N  7436W

A1 DOVER                                   84        KDOV

A2 ANDREWS                                148        KADW
   ****NOTE--THIS IS NOT A LOW ALTITUDE ROUTE****
```

Figure 3

Advantages

The CFP has become a way of life. Although it's possible, it would be highly impractical to revert to the old system of manually preparing a flight plan. We presently have about 2,500 routes in the computer, and from these the computer prepares about 20,000 flight plans each month. This operation takes about 30 hours of computer time. In comparison, it takes a minimum of 30 minutes for a navigator to manually spin a flight plan, or roughly 10,000 man-hours a month to equal the output of the big machine. Obviously, considering speed, man-hour economy, the present austerity program, and the nav shortage, the CFP is here to stay.

With few exceptions, aircrews and flight planning personnel depend on the computer flight plan to complete the MAC mission. Efficiency, safety, manpower savings, accelerated mission accomplishment and improved quickstop procedures — all are a result of the modern computer flight plan. With benefits like these, even Euclid would take a bent line between points.



The Numbers Game

Hey gang, another test! No, wait! Don't throw up your arms in despair. Before you tackle this little quiz, we want you to sit back, relax, and read the latest issues of *Playboy* and *Penthouse*. Get in the proper frame of mind. Okay, now that you've got all that out of your system, let's think about airplanes and numbers.

Here are the rules. We have selected various numbers from the Dash Ones for several aircraft. We have listed them under the crew position of the man who should know them. We've not identified units of measurement for the numbers because many of them can apply to more than one thing. For example, 20 might be 20 lbs per square inch, 20 degrees, or 20 seconds. (We figured it would be too easy if we were that specific.) Think of, or jot down on a piece of paper, the things these numbers bring to mind. You can check your answers against ours, which you'll find on the next page. If your answer isn't listed, it might still be correct because we had only enough space to print one answer for each number. Okay, press on, have fun, and enjoy — The Numbers Game!

C-141 Flight Engineer

Questions

1. 5 or 10,000
2. 30-52
3. 5,000
4. 180
5. 738
6. 555
7. 109-122
8. 19-25
9. 1.2
10. 1.5
11. 420
12. 565
13. 15
14. .045
15. 71

C-141 Navigator

Questions

1. 25-35
2. 165
3. ±1.5
4. 41
5. 8
6. 270
7. 67.5 or 56.25
8. 30
9. 5
10. 950
11. −10 to +92
12. +15 to −15
13. 0 to −5

HH-43 Pilot

Questions

1. 30
2. 70
3. 500
4. 6
5. 10
6. 3
7. 201
8. 260
9. 230
10. 55
11. 273
12. 650
13. 60
14. 300
15. 15

Game

C-141 Flight Engineer

Answers

1. During local training flights, new landing data will be required if a change in flap configuration, a temperature change of 5 degrees C or more, or a gross weight change of 10,000 lbs or more occurs.
2. When starting an engine, the manifold bleed air pressure should not be less than 30 psi and shall not exceed 52 psi, prior to engaging the starter button.
3. The average fuel jettison rate is approximately 5,000 pounds per minute from the auxiliary and extended range tanks.
4. Maximum CSD oil temperature.
5. Maximum APU exhaust gas temperature.
6. Maximum engine exhaust gas temperature.
7. Normal AC voltmeter reading.
8. DC voltmeter caution range.
9. AC loadmeter maximum reading.
10. DC loadmeter maximum reading.
11. Maximum frequency meter reading.
12. When engine EGT exceeds 565 degrees C for any time, either shut the engine down or land as soon as possible. If the engine is to be shut down, allow it to cool for 5 minutes at idle prior to shutdown.
13. Peak temperatures are reached in the tire bead area as late as 15 minutes after stopping.
14. If wing anti-ice is required after lift-off, reset the EPR to 0.045 below the computed TRT EPR. Do not use wing anti-ice prior to lift-off.
15. At 71 degrees C the windshield rain removal system overheat lights will illuminate.

C-141 Navigator

Answers

1. Pressurization of 25 to 35 inches of mercury is maintained in the AN/APN 59B radar system.
2. Slew doppler ground speed counter to 165 before takeoff.
3. The ASN-35 computer tolerance is approximately ± 1.5 percent of the distance traveled.
4. Only 41 stars are permanently stored in the celestial data panel and correspond by number to stars in Vol I, H.O. 249 Celestial Tables.
5. Number of days the clock will run if properly wound.
6. 270 degrees is west.
7. Above 67.5 north latitude or below 56.25 south latitude, local variation is not stored in the computer, and the DG mode must be used (on aircraft with revision D ASN-24 computers). Also, the computer goes into polar mode internally.
8. If the electrial power is interrupted before the ASN-24 computer has completed a programmed shutdown cycle, certain stored information may be lost. If preset coordinates are to be retained for a subsequent leg of a flight plan, place computer switch to off at least 30 seconds prior to removing power from the aircraft buses.
9. To obtain a valid time difference readout on the loran envelope counter, add or subtract the envelope settling readout to or from the envelope counter to obtain the same value as the phase counter. If the envelope settling dial approaches the number 5 avoid ambiguity by waiting until the value of the envelope settling dial drops to four or less.
10. 950 knots is ground speed you slew on the doppler display indicator for a doppler ground speed tie-in check of the compass systems.
11. Azimuth limits of periscopic sextant.
12. Angular range in degrees of Stage I of VERNAV.
13. Angular range in degrees of Stage II of VERNAV.

HH-43 Pilot

Answers

1. Hold-down feature of starter circuit does not function above 30 percent Ng (for HH-43B only).
2. Maximum airspeed for inflating flotation gear.
3. Minimum cargo weight for use of the automatic sling release.
4. Hot section inspection required after six hours of accumulated operation with emergency fuels.
5. 10 psi of engine oil pressure required on starting when N_1 reads 40 percent.
6. Minimum time in minutes required between engine starts.
7. Minimum rotor rpm during autorotation.
8. Maximum rotor rpm for powered flight.
9. Minimum EGT for powered flight.
10. Maximum headwind for starting or stopping the rotors.
11. Maximum rotor rpm for ground operations.
12. Engine hot start if EGT exceeds 650°C for more than five seconds.
13. Maximum autorotation entry airspeed.
14. Maximum rate of descent during the last 100 feet of a power approach.
15. Maximum slope angle for landing.

GOOD SHOW

Major Benson

AIRCRAFT EMERGENCIES occur every day and generally fall into two categories: minor and, occasionally, disconcerting. Major Frederick J. Benson, an HC-130 instructor pilot in the 1552d Flying Training Squadron at Hill AFB, had an emergency that fits into a third category: Downright hairy!

Early last fall Maj Benson was on a normal low-level training, search mission at 1,300 feet above the ground. He was in the right seat and a student pilot was flying from the left seat. A normal mission? Yes, but, as normal missions sometimes do, this one went to #$%& in a hand basket. Suddenly, the yoke jerked from the student's hands and the '130 entered a steep dive. *Runaway trim!* Maj Benson took control and recovered the Herky Bird from the breathtaking dive 800 feet above the ground. This rapid descent was immediately followed by a very rapid ascent. Maj Benson was forced to use both hands and feet to counter the forces imposed by the malfunctioning trim. Elevator tab power selector — *off!* Emergency DC position — *select!* Now he was able to trim the '130 in straight and level flight. But his problems were far from over.

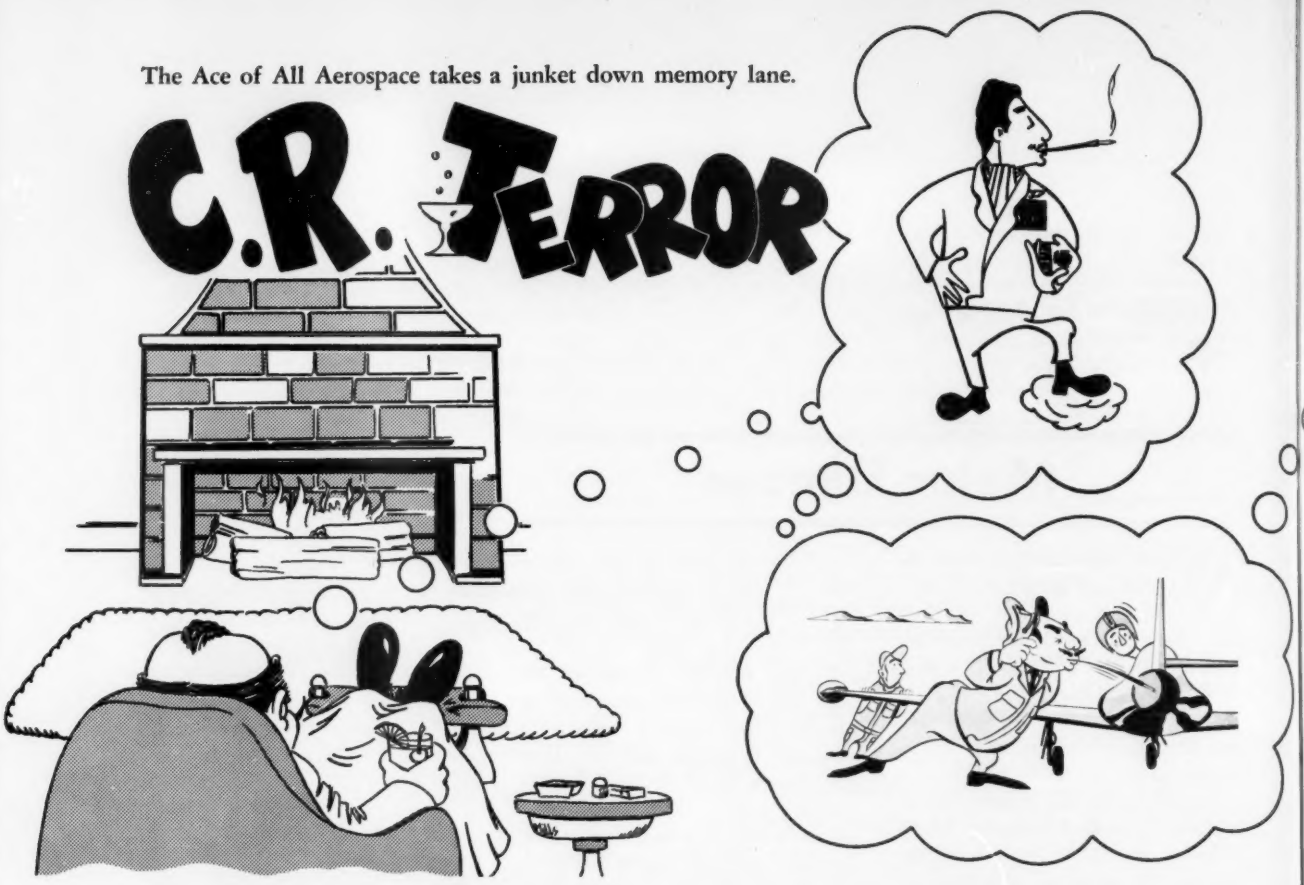
In just a matter of seconds the trim *again* ran full up. Another hands-and-feet exercise and they were back to straight and level. Then Maj Benson found by intermittently selecting normal on the tab power selector switch and turning it off as the trim indicator passed through zero that he could maintain level flight. One problem was solved, but a big one still was ahead: approach and landing.

Experimenting, he found that he could control the aircraft at 145 knots and 50 percent flaps without the use of trim. Maintaining this aircraft configuration, Maj Benson returned to Hill, completed a long flat approach, and landed.

His outstanding airmanship and professional manner in analyzing and compensating for this flight control malfunction prevented the possible loss of life and aircraft. THE MAC FLYER proudly says, "Good Show."

The Ace of All Aerospace takes a junket down memory lane.

C.R. TERROR

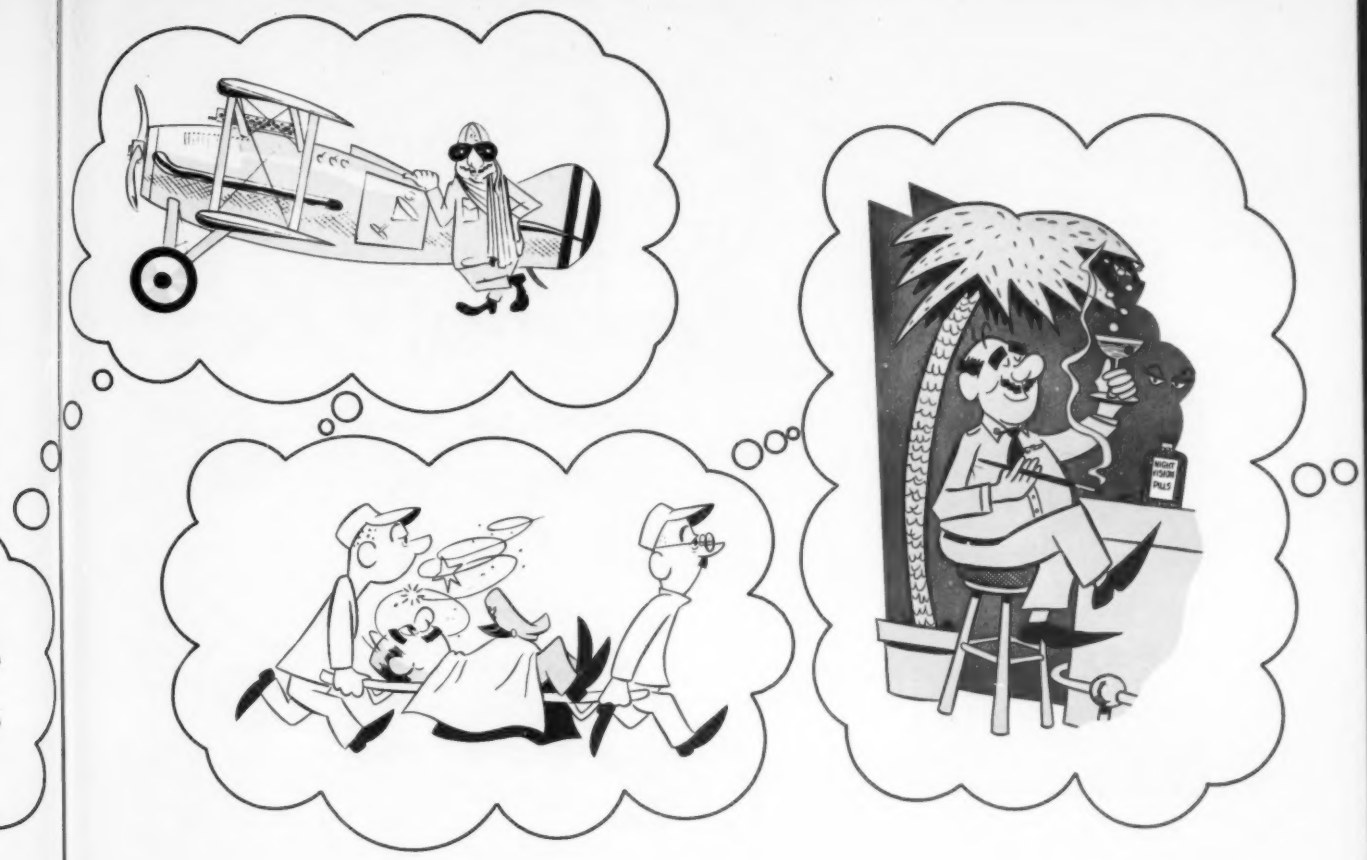


DARKNESS HAD FALLEN—the early darkness at the end of a gray winter's day. Outside, the sky was still spilling flurries of snow, making silent bursts of activity below the street lights. Inside, a fire gently crackled and popped, casting wiggling shadows around the room. The glow of the blaze flickered from the tones of the spit-shined calfskin jodhpurs propped lifelessly on the hand-tooled camel saddle. The owner of the boots, normally a dervish of activity, slouched motionless in the stillness. To anyone peering in through the window, the fire would have been the only lively thing to be seen.

C. R. Terror, Ace Aviator temporarily turned Corpulent Cogitator, had been slumped in his favorite chair for over an hour. Earlier, he had been having a merry afternoon — as the pile of cherry stems would attest — swapping yarns from bygone days with Sam and Blinky. Then his visitors had left: Sam off to supper with the wife and kids, and Blinky bound for an evening of petit-point. By now, the glass which had held the Master Manipulator's last Old Fashioned was warm and almost dry, his last Egyptian Oval was long cold in the crystal ash tray, and the tape recording of Melissa Marvelmouth, his favorite torch singer, had long been silent.

C. R. watched without seeing as one spark, then another, flew from the embers to die in mid-air. In the waning hours of the old year, MAC's Elder Eagle was lost in a forest of reverie.

His mind wandered back across the decades — back to the day when his old buddy, William C. Anderson, had wangled him the assignment to the transport pilot's holy land — the head shed. Was it *that* long ago? Seventeen and a half years since he joined the old Military Air Transport Service at Andrews? He frowned suddenly as he recalled his ignominious beginning: a gear-up landing in a C-45. Other scenes followed — his promotion to major (thanks to the efforts of his MATS fans), his leap to the jet age in his first T-bird ride, the time he drove a C-54 through a GCA shack, the gear-down water landing in an amphib, the now-infamous brandied pepperoni waffle breakfast, the wife he'd long ago left behind, and that horrible episode when he accidentally took Miss Ugly of 1912 home from



a dimly-lit bar because his night vision had failed him.

A flood of bygone scenes now — his first passover to LC back in '58, his mind-bending RON in Paris, his many talks to the wives' clubs, his checkouts in every flying machine the command ever owned. He smiled painfully at the thought that by now he must be one of the very few who knew why P-series jocks had such strong right legs, where MATS' fighter outfit had been stationed, and which throttle on a Dumbo had to be brought up first to make a water takeoff.

Seventeen-plus years — over two hundred escapades bad enough to decorate the pages of the safety book. The total made him wince and brought an expression of chagrin. Such an ironic fate — to be forever cast as a bad guy in spite of his many outstanding contributions to the betterment of mankind. "After all," he reasoned, "who else could boast such skill with a portable m r-tini kit, such expertise with the fair sex, such unique and regular displays of stellar airmanship? And then to have all this countered by a few unfortunate exploits which some dimwit insisted on blabbing all over the MAC realm. Bah! *Humbug!* Fine way to be treated after all I've done for the command!"

His mood began to grow as dark and chill as the world beyond his window, and he drew the eiderdown lap cozy more closely about him. "Miserable outfit anyways," he mumbled. "Fly all night, get eggs for supper and hamburgers for breakfast, and then spend all day worrying about filling training squares. Maybe I ought to volunteer for one of those cushy jobs in USAFE — or air attache in New Zealand. Bah! Double humbug!"

By now he was glowering into the fireplace and his earlier air of relaxed enjoyment had been replaced by a visible blue funk. As he looked back at his past from the standpoint of what had gone wrong, his funk degenerated into downright dejection. Not only had he checked out in every aircraft, he'd *wrecked* every aircraft. In the embers he suddenly saw visions of smoldering wreckage now long cold. Sometimes he stood on the sidelines unscratched; sometimes he jiggled under the assuring hand of the crash medic as the big blue meat wagon sped him from the scene. "Yecccccchh" he spat dispiritedly,

"I'll bet I've shot nineteen hundred and seventy one million dollars, at least. And it usually wasn't really my fault. Why did everything I tried to do turn into . . ."

A horrible crash shattered his black bubble of depression as a maid dropped a metal trash can on the concrete floor outside his door. The reverie had been so deep that the noise launched him into a half-standing position, and his flailing hand knocked his glass onto the rug. As he stooped to retrieve it, his eye caught the well-worn corner of his old flying school class book. With an expression that said "here we go again . . ." he eased the volume from the stack on the lamp table and began thumbing through it.

"Ah, *that* was an *airplane!*" he said with just a trace of a smile as his eyes caressed the familiar details of the BT-13. "It took a real man to fly that bird — cool hand, keen eye, mucho guts and hair short enough to keep from getting caught in the goggle strap. Yeah, those were the days — the survivors got promoted, there was room for a little individuality, and civilians treated us like real people. Those *were* the days!"

He continued flipping through the pages, recalling this face for his wild night life and that one for his flaming demise. Only a few were still on active duty, like . . . "Old Buzz Conklin — last time I saw that rascal, he gave me an aerobatic re-qual ride in a T-bird — and we flamed out when he forgot to switch tanks. And he's the guy that ground-looped a gooney bird during takeoff in a crosswind, and hit five miles short on a night VFR approach when he didn't see the red flag on the glide slope indicator. What a dunce!"

C. R. chuckled a bit at the booboos of his classmate, then remembered where he'd last seen Conklin's name: on the bird colonel list. That thought brought him up short — how on earth could his old foul-up buddy get two whole grades ahead of him? "Must be sheer, dumb luck," he told himself.

Then he laid the book down and began stroking his well-waxed mustache. "Hummfph. If he could do it, I can too," he nodded. "Lemme see, now. Ah, roger — yeah, that's it."

He eased his unique anatomy upward and stood squarely before the fire. "I know what I'll do," he pronounced in a resolute voice, "I'll start off the year as a new man. No

more cutting corners, no more bending the rules, no more letting Sam con me into some dumb bash. I got the experience, I got the smarts, and all it'll take is a couple of good tickets to get me back on the track. Yeah, baby, that's what I'll do. 'I hereby resolve to . . .' "

His arm-waving rhetoric was cut short by the jangling telephone. "Major Terror," he purred into the instrument, " 'brand new in seventy-two.' Yes?"

There was a surprised pause at the other end, then "Hey, chief, you been checking corks again?"

The Great One recognized the voice of Long Suffering Sam, the Reliable Rightseater, and shot back, "Nope. Just spending a quiet evening at the fireside. And what's on your mind, if I may use the term loosely?"

"Well," Sam replied, ignoring the jibe, "somebody goofed. There's a big party tonight in Doc's heated four-car garage and we were supposed to be invited. A guy just called me and asked if I'd tell you — he said something about him not wanting to break the news to you that he'd dropped the ball."

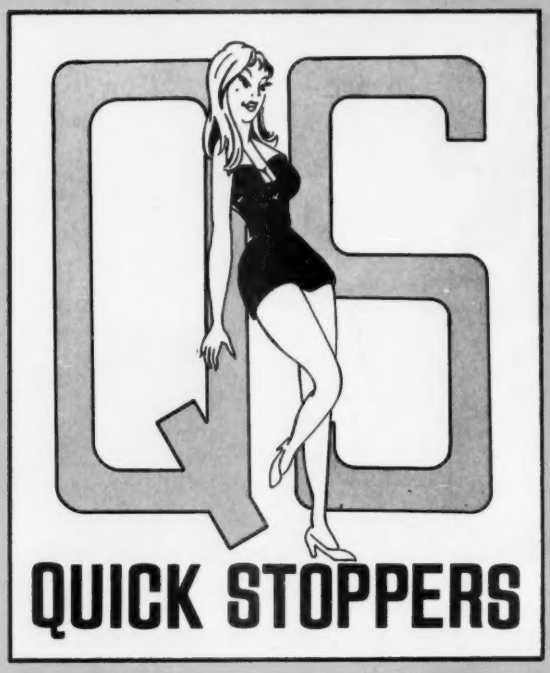
"An unfounded worry, Sammy. I would have been eminently friendly — after all, what better way to start off the new year than in the company of kindred spirits? What time do the festivities begin?"

"About nine, chief. I'll be by to pick you up at ten of. Okay?"

"Sounds like a winner, m'boy. And be ready for anything lad — your leader is gonna show you a new side, starting tonight."

He plopped the receiver gently back in place, then with blinding speed assembled the world's quickest martini. Clutching the dripping glass, he skipped nimbly into his bathroom and faced himself in the mirror. With a drop-slinging whirl, he lifted the drink in a toast. "To you, August Fellow," he proclaimed. "A new man in the new year. Success! Happiness! Promotions! *Hurray!*"

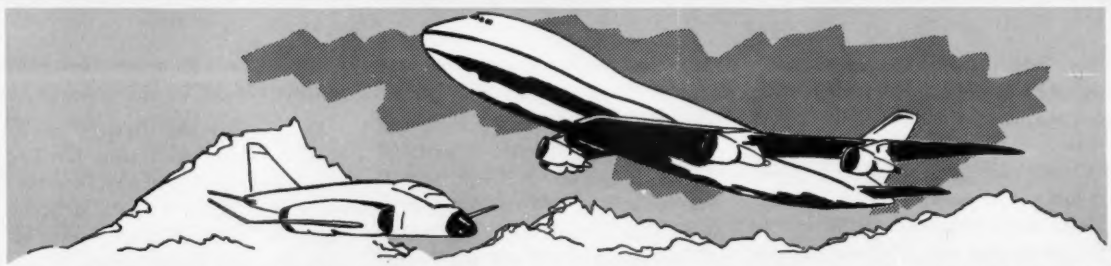
Bubbling with cheer, he jabbed the glass upward — and watched in frozen amazement as it slipped from his fingers and crashed on the marble counter, sending a sparkling spray of gin and glass around the room.



Fifteen Years Ago

In THE MATS FLYER for January, 1957: Charleston was identified as the new point of departure for personnel reassigned to French Morocco, Libya, and Saudi Arabia — COMATS, Lt Gen Joseph Smith, cited our need for 5,000-mile range jets — The good show went to an SH-19B crew at Spangdahlem — Air Rescue Service was highlighted — other features discussed wake turbulence and transient maintenance — and C. R. Terror logged a unique breakfast of Hungarian meatballs, tortilla omelette, green peppers stuffed with fermented artichoke leaves, and pepperoni waffles washed down with green dandelion brandy.

Tangible Traffic



Air traffic controllers, assisted by radar, always do their best to keep us informed of other aircraft in our vicinity. Unfortunately, because of altitude differences or visibility restrictions, we often can't see the traffic even after we've been warned. Because of this, some pilots tend to acknowledge these advisories, then promptly ignore them. That isn't a good idea and here's a case in point.

A Boeing 747 (that's right friends, a 747), with 300 passengers aboard, was descending at 1,000 feet per minute, 340 knots IAS. The copilot was flying the aircraft using the autopilot when they were advised by ATC, "Traffic one o'clock, moderate speed."

The airline crew spotted a military jet fighter against a mountainous background, on a collision course. The copilot punched off the autopilot and began a climb. The fighter passed about 300 feet under the huge airliner without ever changing heading or altitude.

This was an outstanding example of a controller earning his pay, for life, during a few brief seconds. However, his effort would have been wasted if the flight crew had not heeded the warning. If you've ever been warned of traffic and not bothered to look for it because you thought you wouldn't see it anyhow, consider this: The airplane you don't see may well be the one that hits you — and it'll only take one.

A Legend for Aviators

This is not going to be a legend from history but it *will* be one to remember — that is, if you want to operate your flying machine safely. To start, let's ask a very simple and direct question. When was the last time you really studied the aerodrome depiction diagram at the bottom right hand corner of a letdown chart? Your last landing, you say? Okay, then answer this one: Can you honestly say you knew what every symbol used there meant? You better say no — or the rest of our tale is for naught.

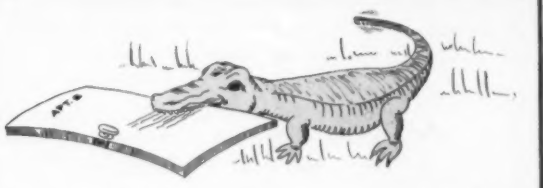
You may ask what prompted these questions. Well, when a C-141 transited a naval air station recently, the engine blast displaced the portable fresnel lens optical landing system. The Navy was slightly torqued and the lens system moderately damaged. The C-141 pilot said he saw the system as he executed a 180 at the end of the runway but didn't realize that it was mobile.

After we saw this incident report we asked ourselves several questions, and one was: Where do you find this type information? So we dug out the IFR supplement. The air stations we checked didn't have any comments under "aerodrome remarks" that the lens system might be a hazard to large aircraft or that large aircraft might be hazardous to it. But we remembered receiving briefings at Yokota that if we used Atsugi NAF as a departure alternate, we should make sure they moved their optical lens system or we might ding a wing tip. Checking a little bit further we found a symbol and a note in the *legend* of the instrument approach procedures (letdown book). The note says, "U.S. Navy Optical Landing System 'OLS' location is shown because its height of approximately seven feet and proximity to edge of runway may create an obstruction for some types of aircraft." Sure enough, when we checked several naval air stations in the letdown book we found the little symbol that you see in the title of this blurb.

We have learned at least two things in this little exercise. First, it can be hazardous operating around an "OLS," and second, we should check the letdown book legend more often.

How about you?

"If at first you don't succeed--"



After takeoff in a T-39, the crew retracted the landing gear but were unable to get an up-and-locked indication. Not being the kind to give up easily, they *recycled the gear four times*, but still couldn't get it up. Finally admitting defeat, they lowered the gear and landed.

Investigation revealed the problem was probably due to an alligator clamp, used to ground the aircraft, which had been left on the forward edge of the nosewheel door. The clamp became wedged between the door and the forward fuselage preventing full retraction of the nose wheel.

The pilot said he hadn't seen a clamp during his preflight inspection, which says something about the degree of professionalism involved on the flight. But the fact that he recycled the gear four times says even more.

Whenever a piece of machinery doesn't do what it's supposed to do the first time, it's trying to tell you something. When the machinery in question is something as important as a landing gear system you really should listen. If there's something wrong with it, repeated operations probably won't fix it and may well mess it up even more.

Unless you have specific instructions for your aircraft that are different, here's a good rule for gear malfunctions in any airplane: If you can't get an up-and-locked indication — the first time — put the gear back down. If it goes down and locked, leave it alone and land.

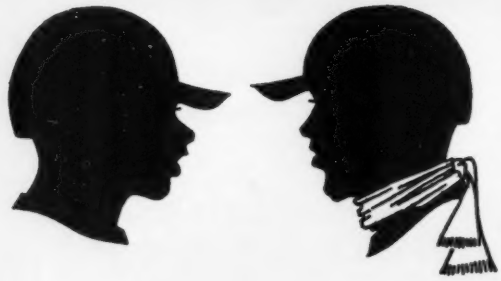
Safetied Switch Snafu

Two maintenance types were looking for a suspected leak in the crew oxygen system of a C-135. They had removed all the oxygen regulators and were checking the hoses when the crash position indicator popped from the tail of the aircraft, fell to the ground, and began transmitting.

Sure enough, the CPI switch was found in the deploy position, but neither maintenance man had touched it. Apparently one of the oxygen hoses snagged the switch during the trouble-shooting process and moved it.

But the switch should have been guarded and *safetied!* The aircraft's records said that the guard on the CPI switch had been safetied over a week earlier, but no trace of any safety wire could be found immediately after the mishap.

Aircraft switches are guarded and safetied for good reason. As crewmembers, it's part of our job to know which switches should be safetied, and to write up those that should be, but aren't. If you had flown this aircraft on the previous mission, would you have noticed the missing wire? More importantly, would you have done anything about it?



"Christmas present?"

"Yeah, my mom knitted it for me."

Bold Print Bust?

Every once in a while we've heard crewmembers complain that they've missed questions on their bold face emergency procedures written exam because their answers were not word for word from the flight manual. If their exams were graded that way, they have a valid complaint — the examiners were not following current Air Force policy. *TIG BRIEF*, 7 May 1971, said examination programs are deficient when bold face examinations require verbatim responses.

Crewmembers are required to commit to memory *the actions required* during an emergency, and examinations should measure their ability to perform these actions. The best place to test bold print procedures is in a simulator, demonstrating performance instead of rote memory.

If a written examination is used and the crewmember gets the basic thought of the action on paper, his answer is correct. There are many ways to say, "1. FIRE HANDLE — PULLED (P)." Obviously, "T HANDLE — PUSHED" would be incorrect but we doubt that many crewmembers would respond that way. Let's keep our training — and our testing — realistic.

Ten Years Ago

In January, 1962, THE MATS FLYER cast an eye to the future. The lead article reported on a new transport just in the wooden mockup stage: the C-141. Operational requirements included: must fly "comfortably" from 6,000-foot strips; must load from truck-bed height; must have uncomplicated maintenance. The cockpit mockup displayed only painted squares showing "integrated flight system and vertical tape instruments." *(Note: We received word as the current issue was going to press that Starlifters had just flown their three millionth hour!)*

Good Show for the month went to a Moffett-based Navy C-121G crew for an emergency landing on Kure Island, the major accident rate for the year just ended was 1.1 per 100,000 flying hours, and C. R. Terror, in a change of heart, spoke softly to a TCC duty officer.

Stuck Sabreliner Struts

Recently, a T-39 was nearing the end of a local training mission. For the final landing, the flight examiner — in the right seat — planned to demonstrate the use of emergency brakes. After touchdown, when he applied the brakes, the aircraft veered left! The pilot quickly selected normal brakes and tried to stop the left turn with the nose wheel steering only to discover he had no nose wheel steering! Without it, he was unable to correct the Sabreliner's swerve to the boondocks. But he did manage to miss the runway lights as they went off the side, then brought the bird back onto the runway and stopped it with no damage.

An inspection of the aircraft after the incident uncovered the cause of the pilot's problems. Just prior to the flight both main landing gear struts had been overserviced. On touchdown the struts had not compressed enough to close the touchdown relay and, with the relay open, the nosewheel steering was inoperative.

Since this incident was reported, we've heard a rumor that even properly inflated struts might not compress on landing if the aircraft is very light and the landing is made smoothly. If anyone's had this happen, we'd like to hear about it.

Murphy Lives!

The crew of a four-engined transport from another command encountered severe flight control difficulties just after takeoff on a routine airlift mission. The aircraft's right wing was extremely heavy; it took twelve degrees of trim and two-thirds of the available opposite aileron to keep the aircraft under control. The pilot immediately declared an emergency and, despite his problems, managed a successful landing.

After they were back on the ground, the reason for the flight control difficulties became painfully apparent. The right aileron was *disconnected!* It seems the aileron push-pull rod had been disconnected during some fuel tank maintenance and this Red X condition was never entered in the forms! The rod was forgotten and never reconnected when the maintenance was completed. The inoperative aileron was overlooked by the flight engineer during preflight, because he completed his checks without a ground scanner!

This Murphy obviously happened in another command, because with our thorough maintenance and aircrew procedures it could never happen in MAC — *could it?*

the ANALYZER

"You're too late!"